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ORDER NO. 2792

UNITED STATES OF AMERICA
POSTAL REGULATORY COMMISSION
WASHINGTON, DC 20268-0001

Before Commissioners: Robert G. Taub, Acting Chairman;
Tony Hammond, Vice Chairman;
Mark Acton;
Ruth Y. Goldway; and
Nanci E. Langley

Periodic Reporting
(Proposal Thirteen)

Docket No. RM2015-7

ORDER APPROVING ANALYTICAL PRINCIPLES USED IN PERIODIC REPORTING (PROPOSAL THIRTEEN)

Washington, DC 20268-0001
October 29, 2015

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I. INTRODUCTION

Background. On December 11, 2014, the Postal Service filed a petition seeking consideration of Proposal Thirteen, which describes an updated and revised approach to developing estimates of city carrier street time costs and presents a cost model to implement the proposed approach.[1] For the reasons discussed below, the Commission approves Proposal Thirteen.

[1] Petition of the United States Postal Service for the Initiation of a Proceeding to Consider Proposed Change in Analytical Principles (Proposal Thirteen), December 11, 2014 (Petition).

Summary of changes to cost model. Proposal Thirteen updates the current city carrier street time cost model (the current model) by replacing data from a FY 2002 special study (the Docket No. R2005-1 Street Time Study) with recent data obtained primarily from two established operational systems: the Delivery Operations Information System (DOIS) and the annual rate evaluation system.[2] The annual rate evaluation system's data are contained in the Form 3999 database. Proposal Thirteen also revises the current model primarily by developing cost estimates for in-receptacle parcels — which are currently part of the Regular Delivery regression — in a separate regression referred to as the In-receptacle Parcel model. In-receptacle parcels are parcels that fit into a customer's mail receptacle. Parcels that do not fit into a customer's mail receptacle and must be delivered to an alternative location are referred to as deviation parcels.

Proposed alternatives. United Parcel Service, Inc. (UPS) proposed alternative costing approaches, along with related cost models, based principally on its objection to the Postal Service's use of separate regressions for in-receptacle parcels and deviation parcels. The UPS approaches considered in this Order are referred to as the National Form 3999 model and Modified Proposal Thirteen.

Summary of findings. Following consideration of the record, the Commission concludes that Proposal Thirteen improves the quality, accuracy, and completeness of the data presented in the Postal Service's periodic reports to the Commission. *See* 39 C.F.R. § 3050.11(a). The Commission finds that Proposal Thirteen is an improvement over the current approach and cost model. The data improvements include replacing data from the Docket No. R2005-1 Street Time Study with more recent data and providing more accurate estimates of mail shape variabilities.

The Commission finds that UPS's concept of a single, unified delivery model warrants further consideration. Accordingly, tied to its approval of Proposal Thirteen,

[2] The current model was presented by the Postal Service in Docket No. R2005-1.

the Commission directs the Postal Service to file a report, no later than February 15, 2016, addressing the topics identified in Part IV.D of this Order. The Commission also directs the Postal Service to provide an update on the status of its investigation into the feasibility of updating the cost model used to assign the costs of Sunday delivery hours and parcel routes. *See* Postal Service Reply Comments at 3.

However, due to concerns regarding measurement error and data reliability, the Commission concludes that UPS's National Form 3999 model and Modified Proposal Thirteen do not offer greater improvement to the quality, accuracy, or completeness of data than Proposal Thirteen.

Organization of remaining discussion. Part II summarizes Proposal Thirteen as well as the comments received concerning Proposal Thirteen. Part III summarizes UPS's proposed models and related comments. Part IV presents the Commission's analysis, followed by the ordering paragraphs in Part V. This Order also contains five appendices. Appendix A presents the procedural history of this docket; Appendix B addresses omitted-variable bias; and Appendix C summarizes the evolution of city carrier street time costing. Appendix D contains citations to the comments, analyses, declarations, and reports filed in this docket. Appendix E contains citations to Chairman's Information Requests, responses to Chairman's Information Requests, motions and other filings, and Commission orders filed in this docket.

II. POSTAL SERVICE PROPOSAL

A. Proposal Thirteen

Documentation. To support the Petition, the Postal Service filed a report describing the comprehensive city carrier street time cost study.[3] For purposes of this

[3] The Postal Service previously presented the results of the Docket No. R2005-1 Street Time Study in support of the current street time costing approach and the related cost model. *See* Docket No. R2005-1, Testimony of Michael D. Bradley on Behalf of United States Postal Service, April 8, 2005 (USPS-T-14).

Order, the report and cost study are referred to as the Street Time Report[4] and Street Time Cost Study, respectively. The Street Time Report reviews the reasons the Postal Service initiated the Street Time Cost Study; describes the impact of the study on the street time costing approach; and explains corresponding updates to the current cost model and refinements to the calculation of attributable costs. Street Time Report at 1.

Scope of Proposal Thirteen. In the Street Time Report, the Postal Service states that the development of city carrier street time attributable costs involves three main steps: assigning total accrued city carrier street time costs to cost pools; calculating attributable costs by cost pool; and distributing attributable costs to products. *Id*. at 1-3. It explains that the Street Time Cost Study updates and refines only the first two steps in the process but does not address the third step because the distribution keys used in the third step are updated annually. *Id*. at 3.

New data sources. In the Street Time Report, the Postal Service describes the selection of, and adjustments to, a database that provides most of the data needed for cost pool formation; explains why it removes in-receptacle parcels from the Regular Delivery model; and discusses other revisions to the Regular Delivery model intended to correspond to the current mail processing and delivery environment.[5] *Id.* at 4-20. It also describes two special cost studies that were conducted to obtain data not available from Postal Service data systems: the FY 2013 Collection Mail Study and the FY 2014 Parcel/Accountable Study. *Id.* at 27-40, 91-100.

[4] The Postal Service filed the Street Time Report both as an attachment to the Petition and in Library Reference USPS-RM2015-7/1, December 11, 2014. Citations are to the Street Time Report attached to the Petition.

[5] The Regular Delivery model is a regression model used to develop estimates of volume variability for delivery of letter and flat-shaped mail. The current Regular Delivery model also produces estimates of volume variability for in-receptacle parcels. As discussed *infra*, Proposal Thirteen removes in-receptacle parcels from the Regular Delivery model.

Special cost studies. For the FY 2013 Collection Mail Study, city carriers recorded collection volumes, by source[6] and shape, for 12 consecutive delivery days (from April 29, 2013 through May 11, 2013) for nearly 300 ZIP Codes.[7] *Id.* at 29-30, 32. For the FY 2014 Parcel/Accountable Study, conducted from March 25, 2014 through April 7, 2014, city carriers recorded delivery times and volumes for deviation parcels/accountables and in-receptacle parcels using their hand-held scanners, along with cards containing study-specific barcodes to record certain actions. *Id*. at 91, 93. The sample data set consisted of the same ZIP Codes that were included in the FY 2013 Collection Mail Study. *Id*. at 91.

Revisions to Proposal Thirteen. The Postal Service acknowledged two errors during the course of this docket and revised Proposal Thirteen to correct those errors.[8] One error was the failure to remove the time required to make barcode scans that were not part of deviation parcels/accountables or in-receptacle delivery. Response to CHIR No. 4, questions 1-2; *see* Response to CHIR No. 3, question 1. Correcting this error reduced the size of both the deviation parcels/accountables cost pool and the in-receptacle parcels cost pool. The other error was incorrectly calculating the variability of deviation parcels. *See* Bradley Analysis of June 8 Neels Report at 2 n.4. A pro forma revision correcting this error increased the variability of deviation parcels from 31.1 percent to 33.9 percent. *See* June 8 Neels Report at 40 n.48; Bradley Analysis of June 8 Neels Report at 2 n.4.

[6] There are three sources of collection mail for carriers: mail from customer receptacles; mail from collection points (such as mail chutes); and containerized mail from businesses. Street Time Report at 30.

[7] The Postal Service states that because regular delivery time is incurred only by city carriers with regular letter routes, the sample does not include the volumes collected by special purpose route carriers. *Id*. at 30 n.13.

[8] *See* Response to CHIR No. 3, question 1; Response to CHIR No. 4, questions 1-2; Bradley Analysis of June 8 Neels Report at 2 n.4.

1. Changes to Cost Pool Formation

Current approach. Cost pools reflect the activities city carriers perform on the street, such as driving to the route or delivering parcels, and the costs that are created by the performance of these activities. Street Time Report at 3. The formation of cost pools requires identifying the proportions of city carrier street time that are spent on these activities. *Id*. These proportions are multiplied by the accrued costs of the relevant cost pools. *Id*. The current model uses time proportions derived from what the Postal Service describes as "expensive special studies that required collection of field data on all carrier activities." *Id*. at 3-4.

Proposed change. The Postal Service proposes largely replacing its reliance on special cost studies to form cost pools with data on carrier activities extracted from the Form 3999 database.[9] It states that to implement this change, data from the Form 3999 database were extracted from the Postal Service's operational data systems in Spring 2013.[10] *Id.* It states that the data are recent, and thereby reflect the relevant operating environment, which includes the introduction of the Flats Sequencing System (FSS), the widespread adoption of delivery point sequence (DPS) mail, and the Postal Service's efforts to rationalize its city carrier network in the face of changes to mail volume and mail mix. *Id*. Following several adjustments, the final database included route evaluations for 112,972 routes. *Id*. at 10-14.

[9] *Id.* The Form 3999 database contains data from the route evaluations the Postal Service conducts to collect data on the time the carrier spends on the various office and street activities on a route. *Id*. at 4. The route evaluation data system consists of one observation for each city carrier route in the country. *Id*. The street time portion of the route evaluation data is often called Form 3999 data. *Id.* at 5. The Form 3999 database does not contain all of the information on in-receptacle parcels, deviation parcels, and accountables needed as inputs to the models, so Proposal Thirteen utilizes a special study to form time pools for delivery of these types of mail.

[10] This period was selected to match the period of time that other data were drawn to estimate the Regular Delivery variabilities. *Id*.

2. Other Adjustments

Adjustment for differences in street time definitions. The Postal Service observes that the operational view of street activities is similar, but not identical, to the current model and asserts that an adjustment is needed to ensure accurate incorporation of the route evaluation data contained in the Form 3999 database. *Id*. at 6. It states that the annual route evaluation system records 16 activities and suggests they can be usefully classified in 3 ways:

- some are directly attributable, which means they have individual time proportions in the proposed city carrier street time cost model and have variabilities applied to them to determine the resulting attributable cost;
- some are indirectly attributable, which means they do not have separate cost pools and/or variabilities and therefore take on the average variability associated with the set of directly attributable activities; and
- vehicle loading and unloading are currently considered office time in the city carrier cost model, which means they are not part of street time proportions.[11]

Id. at 7.

Adjustment for in-receptacle parcels. The Postal Service asserts that an adjustment for in-receptacle parcels must be made before the final time proportions can be calculated. *Id*. at 15. In support of this adjustment, which is a change from the current Regular Delivery model, it states:

> The route evaluation process is designed to produce information that is used to configure carriers' routes. To that end, it separately measures the time associated with those [parcels] that cause the carrier to deviate from the normal process of delivery, because such [parcels] are particularly important in calculating the time requirement for the route. In contrast, the time for [parcels] that fit in the mail

[11] A Postal Service proposal to reclassify vehicle loading and unloading as street costs is under consideration in Docket No. RM2015-2.

> receptacle is included in regular delivery time, as their delivery is considered to be part of the regular delivery process.

Id.

The Postal Service maintains that the current approach is appropriate for a route configuration analysis, but does not meet the needs of an attributable costing analysis. *Id*. It asserts that an attributable costing analysis requires capturing the time for both deviation parcels and in-receptacle parcels, and that this is particularly important because there are more in-receptacle parcels than there are deviation parcels. *Id*. Consequently, the Postal Service asserts that the time proportions based upon the Form 3999 data must be adjusted to account for the fact that some of the time currently recorded as regular delivery is actually time associated with delivery of in-receptacle parcels. *Id*. It proposes making this adjustment using data from the FY 2014 Parcel/Accountable Study. *Id*.

Table II-1 presents the set of street time proportions the Postal Service uses to calculate the proposed cost pools, including the new cost pool for in-receptacle parcel delivery.

Table II-1

Street Time Proportions Used to Calculate Cost Pools in Proposal Thirteen Costing Approach	
Street Activity	**Time Proportion (%)**
Regular Delivery	78.23
In-receptacle Parcel Delivery	4.40
Deviation Delivery	5.39
Collection from Street Letter Boxes	0.20
Travel To and From Route	5.03
Relay	3.82
Network Travel	2.93
Total	100.0

Source: *Id.* at 19.

3. Proposed Changes to the Regular Delivery Model

The Postal Service proposes several significant changes to the Regular Delivery model used in the current costing approach. These include:

- omitting the variable for small parcels;
- establishing FSS flats and DPS letters as shapes for which separate variabilities are estimated;
- establishing cased mail as a variable that is the sum of cased letters, cased flats, and cased small parcels; and
- calculating daily regular delivery time for each route as the difference between daily DOIS street time for that route and a single value of allied time for that route obtained from the Form 3999 database. Allied time refers to the time carriers spent engaging in activities that are not the delivery of mail, including breaks and driving to and from the route.

Id. at 21-26, 42-47.

Table II-2 presents similarities and differences between the current and proposed Regular Delivery models.

Table II-2

Comparison of Current and Proposed Regular Delivery Models

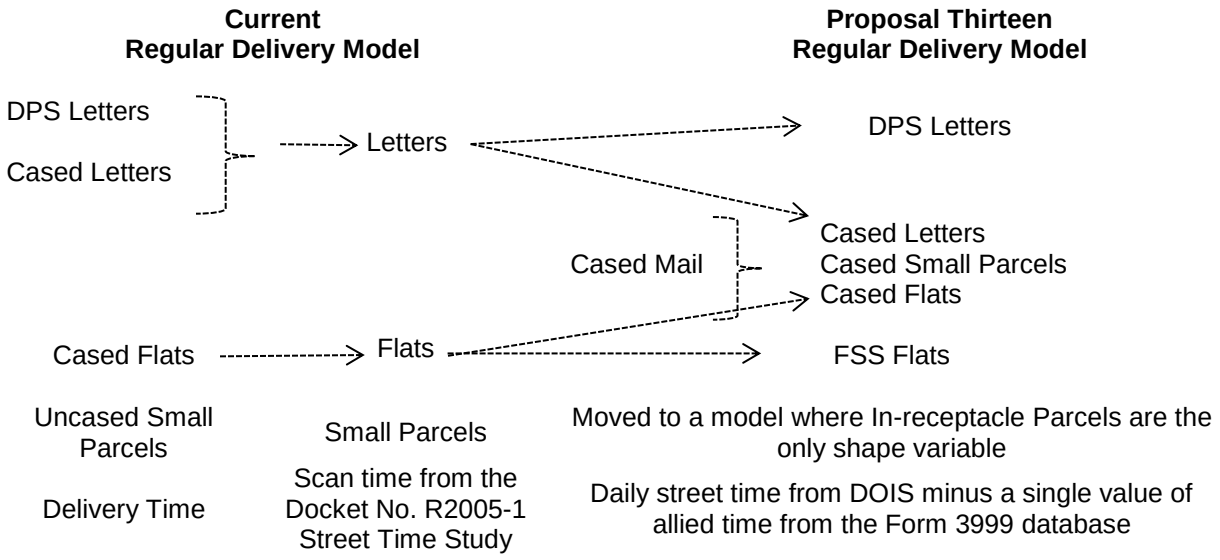
	Current Regular Delivery Model	Proposal Thirteen Regular Delivery Model
Data Sources	Volumes: Mostly data entered manually into DOIS Time: Direct delivery time from FY 2002 scan data	Volumes: Mostly data entered electronically into DOIS and Collection Mail Study Time: Direct delivery time from FY 2013 DOIS with Form 3999 data
Sample	Special study using stratified sample of approximately 150 ZIP Codes	Special study using stratified sample of approximately 300 ZIP Codes
Model Functional Form	Restricted Flexible Quadratic with no interaction terms	Flexible Quadratic with most interaction terms
Level of Analysis	5-Digit ZIP Code	5-Digit ZIP Code
Variables of Primary Interest	Letters (includes Cased Letters and DPS Letters)	---
	---	DPS Letters
	Cased Flats	---
	---	FSS Flats
	Uncased Small Parcels	---
	---	Cased Mail (Letters, Flats and Small Parcels)
	Sequenced Mail	Sequenced Mail
	Collection Mail	Collection Mail
Geographic Variables	Delivery Points	Delivery Points
	Density (delivery points per square mile)	Density (delivery points per square mile)
Geographic and Primary Variable Interactions	Variables of Primary Interest, Delivery Points, and Density	Variables of Primary Interest and Delivery Points
Control Variables	None	Share of Motorized Routes
		Share of Motorized Routes Squared
		Share of Business Stops
		Share of Business Stops Squared
Regression Observations	1545	3485

Sources: Docket No. R2005-1, USPS-T-14 at 29-30; Library Reference USPS-LR-K-81, April 8, 2005, "Estimating Delivery Equations.lst" file; Docket No. RM2015-7, USPS-RM2015-7/1, "Letter_Route_Report" folder, "City Carrier Street Time Study Report.pdf" file at 28; "Regular_Delivery_Equation" folder, "SAS_Logs" folder, "estim_variab_reg_del_time.lst" file.

Figure II-1 illustrates the variables in the current Regular Delivery model which receive variability estimates, and shows how they are transformed in Proposal Thirteen.

Figure II-1

Changes in Variables of Primary Interest



Sources: Adapted from Docket No. R2005-1, USPS-T-14 at 28, 29-31; Testimony of Dennis P. Stevens on Behalf of the United States Postal Service, April 8, 2005, at 3; USPS-LR-K-81, "Estimating Delivery Equations.lst" file; Docket No. RM2015-7, USPS-RM2015-7/1, "Letter_Route_Report" folder at 26-44, 89, 90; "Regular_Delivery_Equation" folder, "SAS_Output" folder, "estim_variab_reg_del_time.lst" file.

Comparision of variabilities. Table II-3 compares the estimated variabilities for Regular Delivery mail shape variabilities in the current and proposed models.[12]

[12] These variabilities are presented to illustrate the type of changes resulting from the updates in Proposal Thirteen. Because all of the shapes except collection and sequenced mail are differently defined and because the proposed Regular Delivery model excludes in-receptacle parcels, direct comparison of variabilities is not possible.

Table II-3

Comparison of Variabilities in the Current and Proposed Regular Delivery Models

Current Regular Delivery Model		Proposal Thirteen Regular Delivery Model	
Shape	Variability (%)	Shape	Variability (%)
Cased Letters	22.3	DPS Letters	16.8
Cased Flats	7.1	FSS Flats	3.0
Sequenced Mail	1.3	Sequenced Mail	3.4
		Cased Mail	7.0
Collection Mail	8.8	Collection Mail	5.4

Sources: USPS-RM2015-7/1, "Regular_Delivery_Equation" folder, "SAS_Output" folder, "estim_variab_reg_del_time.lst" file; Docket No. R2005-1, USPS-T-14 at 39.

4. Introduction of a Separate In-receptacle Parcel Model

Current treatment of in-receptacle parcels. Currently, in-receptacle parcels are included in the Regular Delivery model.[13] In the current model, in-receptacle parcels are referred to as small parcels. *See* Docket No. R2005-1, USPS-T-14.

Proposed change. The Postal Service proposes estimating the in-receptacle parcel variability in a new In-receptacle Parcel model. Street Time Report at 88.

Rationale. The Postal Service justifies the need for a separate In-receptacle Parcel model by explaining that the low daily average volume of in-receptacle parcels compared to regular delivery "makes it extremely difficult to estimate a [parcel] variability jointly with letter and flat variabilities."[14] *Id.* at 85. It also states that delivery of deviation parcels/accountables is currently modeled separately from regular delivery, and concludes that because in-receptacle parcels are delivered differently than deviation parcels/accountables, in-receptacle parcels should be modeled separately from both regular delivery and deviation parcels/accountables. *Id*. at 88.

[13] Docket No. R2005-1, Opinion and Recommended Decision, November 1, 2005, at 68, Table 4-3 (Opinion).

[14] Parcel delivery is comprised of the delivery of deviation parcels and in-receptacle parcels.

The Postal Service states that the cost drivers for the proposed In-receptacle Parcel model are the volume of in-receptacle parcels and the number of delivery points for each ZIP Code. *Id.* It states that the "characteristic variables included to control for variations in the delivery environment are the proportions of in-receptacle deliveries, by mode, and the proportion of business deliveries." *Id*.

5. Proposed Changes to the Deviation Parcel/Accountable Model

Proposed changes. Proposal Thirteen retains the basic structure of the current Deviation Parcel/Accountable model. The only proposed changes are adding route-segment (mode) dummy variables and using a switching regression variable to account for a delivery environment with varying delivery times.[15] The deviation parcel/accountable delivery time variabilities are estimated with quadratic models that include the volume cost drivers, the number of delivery points, and variables that capture variations in the delivery environment. *Id*. at 90.

Table II-4 identifies similarities and differences between the current and proposed Deviation Parcel/Accountable models.

[15] *Id*. at 89-90. This type of model is referred to as a switching or threshold model. The In-receptacle Parcel model is also a switching model.

Table II-4
Comparison of Current and Proposed Deviation Parcel/Accountable Models

	Current Deviation Parcel/Accountable Model	Proposal Thirteen Deviation Parcel/Accountable Model
Model Functional Form	Flexible Quadratic	Flexible Quadratic Switching
Level of Analysis	5-Digit ZIP Code	5-Digit ZIP Code
Variables of Primary Interest	Deviation Parcel Volume and Time	Deviation Parcel Volume and Time
	Deviation Accountable Volume and Time	Deviation Accountable Volume and Time
	Deviation Drive Time	Deviation Drive Time
	Deviation Parcel/Accountable Drive Time	Switching Variable
Geographic Variables	Delivery Points	Delivery Points
Geographic and Primary Variable Interactions	Primary Variables x Delivery Points	Primary Variables x Delivery Points
Control Variables	None	Percent of Volume Delivered in one of five route segments or modes
		Share of Business Stops
Regression Observations	1535	3061

Sources: Docket No. R2005-1, USPS-T-14 at 24-31; Docket No. RM2015-7, USPS-RM2015-7/1, "Letter_Route_Report" folder, "City Carrier Street Time Study Report.pdf" file at 114; "Deviation_Parcel_Acct_Equation" folder, "SAS_Logs" folder, "deviation_acct_variabilities_model.log" file.

Table II-5 compares the variabilities of deviation parcels/accountables in the current model and the proposed Deviation Parcel/Accountable model.

Table II-5

Comparison of Variabilities in the Current and Proposed Deviation Parcel/Accountable Models

Shape	Current Variability (%)	Shape	Proposal Thirteen Variability (%)
Deviation Parcels	28.5	Deviation Parcels	31.1
Accountables	25.0	Accountables	18.0

Sources: USPS-RM2015-7/1, "Deviation_Parcel_Acct_Equation" folder, "SAS_Logs" folder, "deviation_acct_variabilities_model.log" file; *see* Docket No. R2005-1, USPS-T-14 at 39. Note: the proposed variability for deviation parcels shown in this table does not reflect the correction of a small computational error acknowledged by the Postal Service. *See* Bradley Analysis of June 8 Neels Report at 2 n.4.

6. Impact of Proposal Thirteen Costing Approach

The Postal Service's assessment is that the overall impact of the proposed changes on total city carrier street time volume variable costs is "a modest decline" in volume variable costs, with average variability falling slightly from 48.5 percent to 47.3 percent. Street Time Report at 118. It also concludes that while the Street Time Cost Study did not result in much change in overall volume variable costs, it led to changes in attributable costs across products. *Id*. at 119. It provides a table which it states shows that volume variable First-Class Mail street time costs fell, whereas Standard Mail and parcel street time costs increased. *Id*. at 119; 120, Table 52. It asserts: "[t]hese changes are entirely consistent with a decline in First-Class Mail relative to Standard Mail, and increases in both sequenced mail volume and [parcel] volume." *Id*. at 120. The Postal Service provides a breakout of the impact on competitive products under seal.[16] It also presents a table showing the changes in costs per piece using Revenue, Pieces, and Weight (RPW) volume. *Id*. at 121; 122, Table 53.

Table II-6 shows the Postal Service's estimate of the impact on selected market dominant classes and subclasses.

[16] *See* Library Reference USPS-RM2015-7/NP1, December 11, 2014.

Table II-6

Impact of Proposal Thirteen Costing Approach on Costs Per Piece on Selected Market Dominant Classes/Subclasses

Class, Subclass, or Special Service	RPW Volume	Change in Cost per Piece Using RPW Volumes
Units	(000)	$
Single-Piece Letters	21,448,767	(0.02)
Flats	1,894,432	(0.01)
Parcels	247,187	0.01
Total First-Class Mail	66,454,498	(0.01)
Standard Mail		
High Density, Carrier Route, Saturation	27,531,830	0.05
Standard Regular	52,394,259	0.03
Total Standard Mail	80,962,555	0.00
Total Periodicals	6,358,973	0.01
Total Domestic Market Dominant Mail	155,194,663	(0.00)

Source: Library Reference USPS-RM2015-7/4, June 11, 2015, "ChIR_No_4_Resp_Q2" folder, "Prop13.CHIR.No.4.Resp.Q2.Cost_Impacts.xlsx" file.

B. Comments on Proposal Thirteen

1. Direct Marketing Association (DMA)

DMA acknowledges that city carrier street time costs are a significant expenditure but asserts that city carrier street time "represents more than just costs. Delivery to American homes, of which [carrier street time] is the largest component, is the crown jewel" of the Postal Service. DMA Comments at 1. DMA asserts that the last mile of delivery is a valuable asset for the Postal Service and DMA members, and that it is important that the Commission, the Postal Service, private delivery companies, mailers, and the American public understand how to value it. *Id*. DMA maintains that the cost drivers of city carrier street time must be understood so the Postal Service and the Commission can preserve daily mail delivery with intelligent pricing. *Id*.

2. Association for Postal Commerce (PostCom)

PostCom supports the Postal Service's efforts to improve the timeliness of collecting data and updating city carrier costs “by moving from an ad hoc special study method to an annual evaluation.” PostCom Comments at 1. Moreover, PostCom considers it critical that the Postal Service regularly monitor changes in the mail mix, assess the effect of these changes on costs, and appropriately attribute these costs. *Id*. PostCom further asserts that the Postal Service must maintain transparency when collecting and reporting on the costs of products and services, given constant changes in the mail mix. *Id*. It also asserts that the Street Time Cost Study illustrates shortcomings in terms of transparency, and seeks clarification of several matters. *Id*. at 1-2.

Lack of transparency. PostCom observes that although the FY 2014 Parcel/Accountable Study breaks out costs by type of delivery (in-receptacle and deviation), they are not broken out by product or type of parcel. *Id*. at 2. In addition, PostCom asserts that the study does not report to which products the delivery costs of parcels and accountables should be attributed, "simply lumping them all in to one category." *Id*. PostCom states that it understands the competitive sensitivities associated with breaking out the data, but nonetheless requests a breakout of the types of parcel and accountable delivery, as well as the percentage of costs attributed between market dominant and competitive products. *Id*.

Requested clarifications. Based on its understanding of the Street Time Cost Study, the two special studies, and supporting library references, PostCom states that the Commission should obtain answers to several questions before accepting Proposal Thirteen. *Id.* One question is how Sunday delivery and parcel-only routes, which were added after the Street Time Cost Study was completed, will be factored into the cost model and how their inclusion will affect total labor costs and cost attribution. *Id*. at 2-3. Another question concerns the implications of the growth in parcel volume on cost attribution. In particular, PostCom asserts that parcel volume grew 168 percent since

2009, and asks whether there has been a corresponding increase in the amount of street time attributed to these products. *Id*. at 3. PostCom also asserts that the delivery costs of parcels and accountables amounted to only 4.63 percent of street time in the FY 2012-2013 route evaluations, but have increased by over 34 percent since 2009. *Id*. PostCom's other questions are:

- whether total attributable costs are being shifted to institutional costs, given that the Cost and Revenue Analysis (CRA) reports 1.1 percent fewer total attributable costs than the FY 2013 Collection Mail Study;
- whether FSS routes are over-represented in the FY 2014 Parcel/Accountable Study, given they account for 32.6 percent of the routes and exist in more affluent neighborhoods, which PostCom asserts, as a general rule, would generate more parcels; and
- why major markets were omitted from the FY 2014 Parcel/Accountable Study and whether the omission skewed the results.

Id.

3. Public Representative

The Public Representative concludes that Proposal Thirteen is an improvement in the overall quality, accuracy, and completeness of the data the Postal Service presents in the Annual Compliance Report concerning city carrier street time costs, and urges the Commission to require the Postal Service to update the model at least every 5 years. PR Comments at 6, 16. However, the Public Representative criticizes four aspects of the FY 2014 Parcel/Accountable Study: the selection of a time frame that did not capture periodic volume changes and was too short; a "baseless" methodology for calculating an otherwise reasonable adjustment to delivery costs; inconsistent application of the adjustment to delivery costs; and potential misclassification of parcels by participating city carriers. *Id.* at 6-16.

Study period and duration. The Public Representative notes that volumes in the FY 2014 Parcel/Accountable Study were obtained for 12 delivery days in the third quarter. *Id*. at 6-7. She asserts that the study period is not representative of average

parcel volume and is too short. *Id*. at 7-8. In support of this position, the Public Representative presents a graph showing FY 2014 parcel volumes by quarter, which she asserts shows that parcel volumes were at their peak in the first quarter, and at their lowest point in the third quarter. *Id*. at 7. She also observes that the Postal Service acknowledged that mail volumes were not at seasonal peaks or seasonal troughs. *Id*.

The Public Representative agrees that the study period captured daily variations in parcel volumes, but asserts it did not capture any periodic (monthly, quarterly, seasonal, or annual) changes. *Id*. at 8. Consequently, she questions whether the calculated variabilities are representative, and concludes that the Postal Service's model likely understates the costs attributed to parcels. *Id.*

With respect to the duration of the study, the Public Representative asserts that for the study to be meaningful, "the underlying data needs to span a time frame adequate for the analysis of changes in the level of cost drivers." *Id*. at 7-8. She claims the Postal Service has offered no evidence to support a conclusion that volume variability produced by peak or trough volume can be captured by the limited data collection time frame. *Id*. at 8.

Scan time adjustment. The Public Representative notes that delivery time estimates were developed by having carriers use hand-held scanners to scan special barcodes indicating the beginning and end of an activity. *Id*. at 8-9. She states that the Postal Service measured the elapsed time for each activity as the difference between the initial scan and the terminal scan, and adjusted the elapsed time to account for the inclusion of the time to perform the terminal scan using "average time per study scan." *Id*. at 9. This measure was developed from data provided by local study coordinators at selected sites who maintained a record of the additional street time incurred by participating carriers. *Id*. The Postal Service aggregated the responses from all responding sites and calculated the "average time per study scan" by dividing the

aggregate additional street time incurred by the number of study scans from participating carriers at the selected postal sites. *Id*.

The Public Representative agrees that adjusting elapsed time to account for the time to perform the terminal scan is reasonable but criticizes three aspects of the adjustment methodology. *Id*. First, she concludes that the assumption that all extra carrier route time is caused by performing the terminal scan is baseless, given the absence of a "control" or base time with respect to carriers' usual pace, externalities such as weather and traffic, and carriers' potential financial interest in over-reporting the extra time needed for scanning. *Id.*

Second, the Public Representative states that her review of study data by region indicates extra route time was reported in hours. *Id*. She maintains this makes it "nearly impossible" to derive a precise scan time in seconds. *Id*. She asserts that "[t]he greatest possible error when measuring is considered to be one half of the measuring unit." *Id*. She concludes that if the extra time was reported in hours, the measurement error could be as much as half an hour, or 900 seconds. *Id*. at 9-10.

Third, the Public Representative asserts that "average time per scan" varies significantly by region. *Id*. at 10. She considers this counterintuitive because the steps involved in scanning are the same, regardless of region. *Id*. She also asserts that 12 seconds is a long time for scanning, especially when the reported scan time for Delivery Confirmation is 6.23 seconds and participating carriers used the same scanners they regularly use on their routes. *Id*. She concludes that the Postal Service's average time per scan estimate is "too crude" and suggests the FY 2014 Delivery Confirmation transaction time of 6.23 seconds as a possible proxy. *Id*. The Public Representative states that using this proxy results in lower variabilities for in-receptacle and deviation parcels and slightly higher variabilities for accountables. *Id*. at 11.

Inconsistent application of the scan adjustment. The Public Representative also expresses a concern that the Postal Service adjusts elapsed time to account for scan

time in the variability models, but uses unadjusted elapsed time for cost pool formation. *Id*. She explains that because unadjusted delivery time is greater than delivery time with scan time removed, the proportion of street time dedicated to parcels is overstated. *Id*. Consequently, she recommends that the Postal Service adjust the proportion of street time dedicated to parcels to account for scan time inadvertently included in city carrier street time. *Id*. at 12.

Parcel classification. The Public Representative expresses a concern that Proposal Thirteen fails to recognize the relationship between in-receptacle parcels and deviation parcels. *Id*. She asserts that the Postal Service mistakenly assumes that there are two types of parcels and maintains that the Postal Service did not provide any data to support its "binary" view of parcels. *Id*. She also states that the methodology fails to capture the likelihood that mail volume in general, and in-receptacle parcel volumes in particular, affect the volume of parcels delivered as deviation parcels, thus requiring a greater amount of carrier time. *Id*. at 13. Moreover, the Public Representative contends that the Postal Service's binary view of parcels may have caused errors in the data collection process. *Id*. She suggests that data collectors could mistakenly identify small parcels delivered as deviation parcels as in-receptacle parcels and thereby affect the calculated variabilities of in-receptacle and deviation parcels. *Id.* at 12. She recommends that future studies distinguish between parcel size and type of delivery. *Id*. at 16. She also states that to better understand the extent to which misclassified parcels may be an issue, the Commission should require the Postal Service to conduct a new study of deviation parcels/accountables at the route level. *Id*. She also recommends that the Postal Service include interaction terms in its delivery equations to capture the effect of mail volume in general on the volume of deviation parcels. *Id*.

4. UPS

UPS criticizes five aspects of Proposal Thirteen. It also sponsors the Initial Form 3999 model, developed by UPS consultant Neels, as an alternative to Proposal Thirteen. The Initial Form 3999 model, the other models sponsored by UPS, and commenters' observations on the UPS models are discussed in Part III.

Main criticisms. UPS's main criticisms of Proposal Thirteen are:

- improper segregation of parcel and regular delivery in ways that are artificial and unreliable;
- reliance on models that are unnecessarily complex and imprecise;
- unsupported assumptions that the network travel time component of city carrier delivery is fixed and that other components can be piggybacked on the regular delivery time component;
- serious data quality issues; and
- failure to attribute the costs of special purpose routes to competitive products.

March 18 UPS Comments Attaching Neels Report at 9.

Segregation of parcel and regular delivery. UPS asserts that like the Docket No. R2005-1 Street Time Study, Proposal Thirteen rests upon an artificial separation of parcel delivery from regular delivery. *Id*. UPS considers this an example of how the Postal Service's costing approach "relies upon an extremely fragmented view" of its operations. *Id*. at 10. UPS asserts that this separation may be justifiable "only if there is a sound basis" that outweighs the data problems and complexity it generates. *Id*. It contends that the Postal Service offers no such justification and instead relies on untested assumptions and assertions, including:

- the presence, absence, or quantity of parcels and accountables have no effect on regular mail delivery;
- the delivery of regular mail has no effect on the time required to deliver parcels and accountables; and

- the extreme difficulty of incorporating parcels into the primary street time regression.

Id. at 10-11.

UPS also contends that the Postal Service's position that the presence of parcels does not affect the delivery process is contradicted by both the "common sense" explanation of parcel delivery offered in the Street Time Report and recent news reports about the Postal Service's interest in obtaining larger mail trucks. *Id*. at 11-12. UPS concludes that under these circumstances, there is no basis to assume that parcels do not impact regular delivery time. *Id*. at 12. Moreover, UPS asserts that doing so constitutes omitted-variable bias, resulting in miscalculation of the marginal costs and variabilities of postal products. *Id*.

Unnecessary complexity. In addition to the artificial segregation of regular and parcel delivery, UPS asserts that the Postal Service's modeling approach is unnecessarily complex in numerous ways that create a number of statistical issues. *Id*. at 14. However, UPS states that the statistical issues are not intractable and could be solved by either using a larger sample of data or a simpler model. *Id*. UPS also identifies other examples of assumptions that add complexity to Proposal Thirteen, such as the subtraction of allied activities from total street time. *Id*. at 15.

Untested or arbitrary assumptions. UPS also criticizes the Postal Service's operational assumptions about other activities related to delivery time as untested or arbitrary. *Id*. at 17-19. In particular, UPS asserts that the Postal Service has improperly classified network travel time as fixed based on an unsupported assumption. *Id*. at 18. It also challenges the assumption that many other components can simply be "piggybacked" on the regular delivery time component. *Id*. at 18-19.

Data quality issues. UPS asserts that the data quality issues associated with Proposal Thirteen include:

- the sample size for the two special studies;
- the absence of an analysis of the sufficiency of the sample size;
- potentially significant seasonal bias;
- pervasive data scrubbing; and
- modification of normal carrier delivery practices to complete the FY 2014 Parcel/Accountable Study.

Id. at 19-21.

Special purpose routes. UPS notes that although Proposal Thirteen does not address cost attribution for parcel delivery on special purpose routes, the Postal Service has acknowledged the recent institution of parcel-only delivery routes and Sunday parcel-only deliveries. *Id*. at 21-22. UPS also asserts that the Postal Service takes "extraordinary measures" to accommodate the surge in volume when there is significantly increased parcel volume, including the holiday delivery seasons. *Id*. at 22. It asserts that most, if not of all, of these special purpose routes "are entirely or almost entirely" caused by increased parcel volume. *Id.* UPS further asserts that when the primary purpose of a route is to deliver parcels, the vast majority of route costs is caused by, and should be attributed to, parcels. *Id*. UPS maintains that the Postal Service should provide a detailed explanation of how it proposes to handle special purpose routes. *Id*. at 23.

C. Reply Comments on Proposal Thirteen

National Postal Policy Council (NPPC), Parcel Shippers Association (PSA), and the Postal Service filed reply comments addressing initial comments on Proposal Thirteen.

1. NPPC

NPPC acknowledges the Postal Service’s efforts to improve the accuracy of cost attribution methodologies to reflect the current operating environment and concludes

that the proposed modifications appear to improve certain aspects of the current methodology, especially cost pool formation. NPPC Reply Comments at 1, 2. However, NPPC expresses concern about "the seemingly counterintuitive 1.2 percent decrease in the percentage of costs attributed using the Postal Service's proposed new city carrier street time model." *Id*. at 2 (footnote omitted). In connection with this concern, NPPC notes that initial comments have questioned the adequacy of the sampling underlying Proposal Thirteen's volume variability analysis because this could affect the proportion of costs attributed. *Id*. NPPC asserts that these questions warrant examination by the Commission, but concludes they do not undermine the general improvement Proposal Thirteen represents over the current approach. *Id*.

NPPC also notes that commenters suggest that the Proposal Thirteen model might be flawed because the routes used in the sampling did not include Sunday parcel delivery routes. *Id*. at 3. It states that the question for the Commission is whether the omission of Sunday parcel delivery routes from the delivery time variability analysis is sufficiently material to affect the validity of the Proposal Thirteen model. *Id*. NPPC requests that the Commission carefully examine whether the exclusion of Sunday deliveries could affect the validity of the model. *See id*. at 4.

2. PSA

Overall position. PSA agrees with commenters that updating the Docket No. R2005-1 Street Time Study is beneficial, "given the vintage of the study used in preparing the [FY 2014 CRA], the numerous operational and mail mix changes that have occurred in the intervening years, and the substantial magnitude of costs – $11.7 billion plus piggybacks -- involved." PSA Reply Comments at 1. However, PSA challenges the basis for several of PostCom's requests for clarification, questions UPS on several key points, and offers general observations.

PSA reply to PostCom. PSA asserts that PostCom misinterprets readily-available data to argue that the growth in parcel and accountable delivery time

has not kept pace with parcel volume growth. *Id*. at 10. In particular, it contends that PostCom's request for clarification of the relationship of parcel growth volume to street time costs is based on an assumption that the FY 2014 Parcel/Accountable Study shows that street time costs increased by 34 percent between FY 2009 and FY 2012-2013, while Postal Service parcel volume increased by 168 percent. *Id*. PSA asserts this is an incorrect comparison, noting that "while [parcel] volumes have grown rapidly in recent years, they haven't grown by an amount approaching 168 percent over this period." *Id*. PSA presents a table showing that parcel volumes grew by 20-30 percent between FY 2009 and FY 2012-2013, and asserts this is "much more in line with the growth in the [parcel and accountable delivery] percentage over the same period." *Id*. at 10-11. PSA suggests that the 168 percent increase PostCom associates with parcel volume growth actually represents the growth in competitive product mail volume. *Id*. at 11. Moreover, PSA attributes most of this increase to transfers of products from the market dominant to the competitive product list, rather than growth in parcel volume. *Id*.

PSA reply to UPS. PSA characterizes UPS's assertion that the presence of parcels substantially increases the Postal Service's cost to deliver letters and flats as unfounded. *Id*. at 5. It asserts that UPS's suggestion that parcel volumes are the main reason why the Postal Service is purchasing new delivery vehicles is equally unfounded. *Id*. PSA states that while the current and future composition of the mail stream should be taken into account when determining the design of future delivery vehicles, the primary reason why the Postal Service needs new trucks is that its delivery vehicles are decades old and need to be replaced, regardless of parcel volumes or changes in these volumes. *Id*. PSA also asserts that one of the news reports cited by UPS identifies additional reasons why the composition of the mail stream is only one of multiple vehicle design considerations. *Id*.

With respect to UPS's suggestion that all costs for special purpose routes be attributed to competitive products, PSA asserts this would over-attribute costs to

competitive products and thereby reduce the accuracy of cost attribution. *Id*. at 7. In support of this conclusion, PSA states that not all special purpose routes are dedicated to parcel delivery; market dominant products (such as First-Class Mail parcels and Bound Printed Matter parcels) are also delivered via special purpose routes. Further, PSA notes network travel is a function of the delivery network, is not related to changes in volume, and is treated as institutional costs on both letter and special purpose routes. *Id*.

PSA also expresses a concern that UPS's recent filings "could leave the false impression" that market dominant mailers share UPS's concerns about the attribution of costs to competitive products. *Id*. at 9. PSA asserts that PostCom is the only industry association with an interest in market dominant prices that has raised questions related to the attribution of costs to competitive products. *Id*. It contends that PSA members also mail market dominant products so it would be "inappropriate to jump to the conclusion that the market-dominant mailing industry supports UPS'[s] positions." *Id*. at 9-10.

3. Postal Service

Overall position. The Postal Service generally asserts that commenters' concerns provide no valid basis to reject Proposal Thirteen. Postal Service Reply Comments at 42. However, in response to observations about Sunday delivery, the Postal Service states that it is currently investigating the feasibility of updating its cost model to assign the work hours incurred on Sundays and for parcel routes, which are now assigned to products by means of a different cost model. *Id*. at 2-3. The Postal Service also agrees with the Public Representative's suggestion to apply an adjustment for the terminal scan to the elapsed time for cost pool formation and revises Proposal Thirteen based on this adjustment. *Id.* at 11-12. However, the Postal Service expresses reservations about other concerns expressed by PostCom, the Public Representative, and UPS.

Reply to PostCom. Regarding PostCom's concern that the Street Time Report does not include certain parcel and delivery breakouts and distribution of attributable costs to products, the Postal Service explains that the scope of the study did not extend to changes in distribution procedures. *Id*. at 2. However, the Postal Service states that information of the type PostCom requests is presented in the non-public portion of its filing. *Id*.

With respect to PostCom's concerns about parcel volume growth, the Postal Service asserts that due to economies of density in delivery, the attributable costs of a product would not be expected to rise as fast as the increase in volume, especially if much of the additional volume growth is delivered to addresses already receiving parcels. *Id*. at 3. Moreover, the Postal Service states that the parcel delivery proportion of street time increased sharply in the current Street Time Cost Study relative to the Docket No. R2005-1 Street Time Study (8.2 percent versus 5.6 percent). *Id*.

With respect to PostCom's claim that the FY 2013 CRA reports 1.1 percent fewer attributable costs than the Street Time Cost Study and its query whether these costs should be considered institutional, the Postal Service states that the Street Time Cost Study reports slightly lower attributable costs than the FY 2013 CRA due to a slightly smaller overall variability. *Id*. The Postal Service asserts this is entirely consistent with a decline in delivered volumes and results in a small amount of costs being shifted to institutional costs. *Id*.

With respect to PostCom's concern about overrepresentation of FSS zones, the Postal Service notes that 27.7 percent of the ZIP Code days in the study include FSS mail and contends that FSS zones were not overrepresented in the Street Time Cost Study. *Id*. at 4. The Postal Service also clarifies that the analysis was performed at the ZIP Code level rather than the route level, and 84 FSS zones were selected for inclusion in the study. *Id*. Moreover, the Postal Service states that FSS volumes are contained in a separate delivery bundle, and thus a potentially important cost driver of regular delivery time. *Id*. It contends that estimating a separate variability for FSS

volumes was warranted, as was using a substantial number of FSS zones to estimate the variability accurately. *Id*.

The Postal Service asserts that PostCom is mistaken that no major markets were included in the Street Time Cost Study. *Id*. The Postal Service states that because the ZIP Codes were masked, their values cannot be used to determine actual geographic location. *Id*.

Reply to the Public Representative. The Postal Service attributes the Public Representative's concern that the FY 2014 Parcel/Accountable Study was conducted during a period when parcel volumes were at their lowest to a misunderstanding about when this study and the FY 2013 Collection Mail Study were conducted. *Id*. at 5. The Postal Service states that the FY 2014 Parcel/Accountable Study occurred neither at the peak nor the trough of parcel volumes. *Id*. at 6.

The Postal Service also disagrees with the Public Representative's assertion that the time period was too short and fails to capture periodic changes. The Postal Service states that because the data set does not represent a pure time-series database and has a strong cross-sectional component, these concerns do not have merit. *Id*. The Postal Service also considers the Public Representative's suggestion to include seasonal variation in the data set unwise for both econometric and practical reasons. *Id*. at 7-8.

With respect to the Public Representative's challenges to the validity of the estimated time per study scan, the Postal Service acknowledges that the underlying methodology "may not be perfect," but notes that study scan time is "virtually impossible" to measure accurately without physical observation so an estimate must be used. *Id.* at 9. However, the Postal Service disagrees with the Public Representative's suggestion to use delivery confirmation scan time as a proxy on the grounds that it is "a crude assumption" to reduce the final base scan time of 12.46 seconds by half, as well as the fact that the full base scan time is quite close to the average study scan time

calculated during the FY 2014 Parcel/Accountable Study. *Id*. The Postal Service also asserts that the delivery confirmation scan time of 6.23 seconds is not applicable due to the complexity of conducting the special study and the extra steps the carriers had to perform. *Id*. at 11.

The Postal Service agrees with the Public Representative's assessment that it did not originally adjust the elapsed time used for cost pool formation for the terminal scan and notes that it filed adjusted cost pool proportions in its Response to CHIR No. 3, question 1. *Id.*

With respect to the concern about a relationship between in-receptacle and deviation parcels, the Postal Service argues that the Public Representative misunderstands the data collection process. *Id.* at 13. The Postal Service asserts that the study guidance required carriers to classify delivered volume into three separate categories (in-receptacle parcels, deviation parcels, and accountables), and this ensured the correct recording of "the nature of the [parcel]." *Id.* at 13, 14.

With respect to the recommendation to update the street time cost model at least every 5 years, the Postal Service agrees that the costing model should be updated on a more frequent basis, but it does not commit to a specific time frame. *Id.* at 15-16.

Reply to UPS. The Postal Service maintains that UPS's observations contribute little to improving the proposed methodology and "are laden with both factual mistakes and unsupported assertions, which erode their usefulness." *Id.* at 18-19. In particular, the Postal Service disagrees with UPS's criticism of Proposal Thirteen's segregation of regular delivery time from parcel and accountable delivery time. *Id.* at 19. The Postal Service acknowledges the impact of parcels on regular delivery time, but it contends

that the separation of delivery time for in-receptacle parcels, deviation parcels, and accountables allows for estimation of more accurate marginal times by cost driver.[17]

The Postal Service disagrees with UPS's claim that the Proposal Thirteen quadratic model is too complex. It argues that aggregation, rather than complexity, is the real modeling issue and was fully investigated. *Id*. at 23-24. In addition, based on several statistical tests, the Postal Service concludes that multicollinearity in the Proposal Thirteen model is only modest, and that the Proposal Thirteen model itself is statistically sound. *Id.* at 24.

The Postal Service also asserts that Proposal Thirteen is not related to the calculation of incremental costs, and that the assumptions about the fixed network travel time are “well established, widely recognized and long standing.” *Id.* at 25-26. The Postal Service maintains that the Commission established the fixed route time (which is a predecessor of network travel time) more than 30 years ago. *Id.* at 26.

The Postal Service defends the quality of the data in the Proposal Thirteen model, asserting that UPS ignores fundamental differences between the Docket No. R2005-1 Street Time Study and the Street Time Cost Study in this docket. *Id*. at 28. The Postal Service states that these differences include obtaining street time proportions from the Form 3999 database (as opposed to self-recording of carrier activities) and derivation of the majority of variables from ongoing operational databases (rather than from special studies). *Id*. The Postal Service also discounts UPS's claims about the special studies, asserting that "the only real similarity" between the special studies conducted to support Proposal Thirteen and the Docket No. R2005-1 Street Time Study is that both had carriers self-report volume and time information for the delivery of parcels and accountables. *Id*. The Postal Service then describes the steps it

[17] *Id.* at 19-20. The Postal Service explains that this approach prevents overwhelming the parcel delivery time by the regular delivery time. *Id.* at 20.

took to address the Commission's criticisms of the Docket No. R2005-1 Street Time Study. *Id*. at 29.

The Postal Service counters UPS's arguments concerning the special studies by asserting, among other things, that the current sample more than doubles the number of observations available for estimation purposes (3,485 in Proposal Thirteen versus 1,545 in the Docket No. R2005-1 Street Time Study). *Id*. at 32. The Postal Service describes the participation rates as "outstanding," noting they were roughly 99 percent and 91 percent, respectively, for the FY 2013 Collection Mail Study and the FY 2014 Parcel/Accountable Study. *Id*. at 35. The Postal Service also maintains that it did not scrub the data to compensate for poor quality, but used standard imputation techniques to fill in gaps for missing or incomplete data. *Id*. at 36.

In response to UPS's criticism of the exclusion of special purpose routes from Proposal Thirteen, the Postal Service asserts that special purpose routes are separate cost-causing activities, with separate cost analysis structure, and "are not the subject of the current update." *Id.* at 38. Moreover, in response to UPS's assertion that the Postal Service may be failing to attribute the costs of special purpose routes to competitive products, the Postal Service provides a table showing that 56 percent of the attributable street costs for special purpose routes are assigned to domestic competitive products. *Id*. at 39.

The Postal Service characterizes UPS's suggestion that the costs of special purpose routes are now largely borne by market dominant products as fundamentally flawed for several reasons. *Id.* These include, among others, that "parcels" are a shape, not a product and that institutional costs, by definition, are not caused by or associated with any individual products, and such costs should not be assigned to products. *Id*. at 39-40.

III. UPS PROPOSALS

UPS presented four city carrier street time cost proposals in this docket: the Initial Form 3999 model; the National Form 3999 model; Modified Proposal Thirteen; and the Modified National Form 3999 model. Each of these was developed by UPS Consultant Neels.

In response to comments, discussed below, and after obtaining access to the entire Form 3999 database, UPS withdrew its sponsorship of the Initial Form 3999 model, which is based on the sample of 300 ZIP Codes. UPS offered two other models as replacements for the Initial Form 3999 model: the National Form 3999 model (UPS's preferred model) and Modified Proposal Thirteen (an alternative in the event the Commission did not accept the National Form 3999 model). June 8 UPS Comments Attaching Neels Report at 5; June 8 Neels Report at 43. Subsequently, UPS also offered the Modified National Form 3999 model; however, the Commission excluded this model from consideration in Order No. 2646.[18]

A. Initial Form 3999 Model

The Initial Form 3999 model is a single delivery regression which uses a non-linear functional form. March 18 Neels Report at 17-19. This model regresses FY 2013 total street time against the shape variables included in the Proposal Thirteen Regular Delivery regression, plus FY 2013 DOIS large parcels.[19] *See id*. at 19. The Initial Form 3999 single regression does not include accountables or in-receptacle parcels. *See id*.

[18] In Order No. 2646, the Commission granted motions to strike from Amazon and the Postal Service, finding that the Modified National Form 3999 model exceeded the scope of reply comments and consideration of it would have compromised due process and unduly delayed the proceeding. *See* Order No. 2646 at 14-16. The Modified National Form 3999 model reflects two adjustments to the imputation models in the National Form 3999 model. *See* July 23 Neels Report at 11-12 for a detailed description of these adjustments. Because the Commission excluded the Modified National Form 3999 model from the record in Order No. 2646, there is no further discussion of it in this Order.

[19] UPS treats DOIS large parcels as equivalent to deviation parcels.

UPS explains that the Initial Form 3999 model, relative to the Proposal Thirteen model, takes a simpler functional form; excludes *a priori* assumptions about the fixed or variable nature of any cost segments; and removes the short-term bias associated with relying on day-to-day volume changes by averaging within a ZIP Code. March 18 UPS Comments Attaching Neels Report at 23-24.

B. Comments on the Initial Form 3999 Model

1. PSA

PSA argues against the Commission's acceptance of the Initial Form 3999 model on three grounds: use of low quality parcel volume data; lack of differentiation of the costs to deliver various types of mail (*e.g.*, letters, flats, and small parcels) that fit into the mail receptacle; and insufficient testing and evaluation of the model's results. PSA Reply Comments at 4-5.

PSA encourages the Commission to review the econometrics underlying the Initial Form 3999 model, observing that it seems "much more likely that Neels' result is caused by his use of questionable [parcel] volume data in this regression, collinearity between mail volume variables, or other econometric issues than that his result is an accurate reflection of [Postal Service] operations." *Id*. at 6.

2. Postal Service

The Postal Service asserts that the Initial Form 3999 model is subject to serious mis-specification error, heteroscedasticity, and aggregation error, and provides a detailed analysis in support of these criticisms. Postal Service Reply Comments at 40; *see* Bradley Analysis of March 18 UPS Comments at 35-38. The Postal Service identifies six errors it characterizes as serious flaws and asserts that the errors render the model "completely unacceptable and [outside] the Commission standards for an acceptable econometric analysis." Postal Service Reply Comments at 40-41. The alleged errors include:

- imposition of strong *a priori* restrictions on the cost generating process for city carrier street time, without operational or economic justification;
- mis-specification error;
- the assumption that the aggregated non-parcel volume variable and the parcel volume variable have the same exponential coefficient, without accompanying tests or justifications;
- the absence of checks for heteroscedasticity, multicollinearity, or potentially influential observations, all of which could affect inferences drawn from the model;
- the attempt to estimate the non-linear model on less than 300 observations; and
- the model's sensitivity to reasonable changes in specification, as demonstrated by the Postal Service's correction of just three of the model's alleged infirmities.

Id.

The Postal Service asserts that in its review of the Initial Form 3999 model it found only one part of that model that merited further consideration: whether the Regular Delivery regression should include aggregate or disaggregate volume variables. Bradley Analysis of March 18 Neels Report at 1-2. However, the Postal Service states that UPS did not pursue the complete set of tests it had proposed to investigate this issue and thus drew an erroneous inference about the appropriate level of aggregation. *Id*. at 2.

The Postal Service also asserts that UPS confuses cased parcels with in-receptacle parcels, which leads to a misunderstanding of the Postal Service's data collection procedures. *Id*. In addition, the Postal Service reviews other assumptions or conclusions UPS makes, and concludes, among other things:

- refinement of the estimation process for the average ZIP Code data model produces lower variabilities, not higher variabilities;
- there is no omitted-variable bias in the Proposal Thirteen regular delivery equation as a result of excluding DOIS parcel volumes;

- there are significant differences between the coefficients across the different volume variables, calling into question whether the aggregation UPS proposes is appropriate;
- it is impossible to completely institute UPS's approach to using a street time variability because it does not explicitly provide variabilities for in-receptacle parcels, accountables, or mail collected from street letter boxes; and
- UPS's econometric procedure suffers from disqualifying flaws.

See id. at 9-36.

C. National Form 3999 Model

After considering additional Form 3999 data and commenters' observations on the Initial Form 3999 model, UPS withdrew its support of the Initial Form 3999 model and sponsored the National Form 3999 model as one of two other alternatives to the Proposal Thirteen model.[20] In contrast to the Initial Form 3999 model, the National Form 3999 model relies on the entire Form 3999 database, not just the sample of 300 ZIP Codes. In addition, instead of using the Initial Form 3999 model's non-linear functional form, the National Form 3999 model utilizes the same quadratic flexible functional form used in the Proposal Thirteen model.

However, UPS states that the National Form 3999 model reflects some important modifications as compared to Proposal Thirteen. It asserts:

> Specifically, Dr. Neels' [National Form 3999] model takes a more holistic (and realistic) approach, eliminating the artificial division of mail delivery time into "parcel" and "regular" delivery time. Dr. Neels' model also removes other *a priori* assumptions, including that one cost pool is wholly fixed and that the drivers of so-called "allied" activities are identical to the drivers of the corresponding direct street activities.

[20] The other alternative is Modified Proposal Thirteen, discussed *infra* in Part III.F.

June 8 UPS Comments Attaching Neels Report at 4-5. In addition, instead of relying on the Postal Service's two special studies, UPS imputes volumes for deviation parcels, collection mail, and in-receptacle parcels by 5-digit ZIP Code to match approximately 10,000 observations of time and other volume variables in the Form 3999 database. *Id*. at 3; June 8 Neels Report at 47.

D. Comments on the National Form 3999 Model

1. Amazon Fulfillment Services, Inc. (Amazon)

Amazon asserts that the main flaw in the National Form 3999 model is its reliance on imputed values for the explanatory variables for deviation parcel, in-receptacle parcel, and collection mail volumes. Amazon Comments on June 8 Neels Report at 2. It asserts that the "…imputation procedure causes many of the most important explanatory variables to be highly correlated with each other, a flaw known as multicollinearity. The multicollinearity is severe enough to make the model useless." *Id*.

2. Public Representative

The Public Representative does not recommend adoption of the National Form 3999 model at this time, primarily due to the extent to which the data set had to be modified for use in the model. PR Comments on June 8 Neels Report at 2-3, 4-5. However, she asserts that the National Form 3999 model has the following advantages in its approach: inclusion of parcel variables in a single regression; exclusion of FY 2014 Parcel/Accountable Study scan data; and inclusion of allied costs from the delivery pool. *Id.* at 3-4.

3. Postal Service

The Postal Service asserts that a review of the National Form 3999 model shows that it "suffers from fundamental flaws" and provides a detailed analysis in support of this conclusion. Postal Service Comments on June 8 Neels Report at 1; *see generally*

Bradley Analysis of June 8 Neels Report. The Postal Service asserts that UPS's imputation method does not work and, even if the resulting imputations were accurate, UPS's econometric methodology "suffers from other serious flaws." Postal Service Comments on June 8 Neels Report at 2.

The Postal Service states that UPS's assertion that its model is not based upon assumptions is false, noting that the use of a single aggregate street time equation "embodies the strong assumption that all of the various activities a carrier performs on the street have a single, homogeneous cost generating function." *Id*. at 3. The Postal Service also points out that the National Form 3999 model is no less reliant on special study data than is Proposal Thirteen. *Id*.

The Postal Service asserts that the primary inference that can be drawn from UPS's analysis supporting the National Form 3999 model is "confirmation of the difficulty of estimating accurate and robust city carrier street time variabililites for parcel volumes." Bradley Analysis of June 8 Neels Report at 1. The Postal Service explains:

> Both the Postal Service and UPS face a challenge in reliably estimating those variabilities, for two reasons. First, despite their growth, parcels still represent only a small proportion of city carrier volumes and times. A few years ago, the time to deliver parcels was only [5] percent of street time and, although that proportion may have nearly doubled in recent years, it is still a small percentage of total street time. Second, as both UPS and the Postal Service agree, the Postal Service's operational data systems do not include comprehensive and accurate measures of parcels delivered by city carriers.

Id. (footnote omitted).

The Postal Service states that the primary drawback of UPS's use and augmentation of the National Form 3999 model is the "serious omission" of four key volume variables from the dataset: specifically, volumes of mail collected from customers' receptacles, in-receptacle parcels, deviation parcels, and accountables. *Id*.

at 3. The Postal Service argues that these omissions "seriously undermine" the calculation of attributable city carrier street time costs because these volumes are important cost drivers. *Id.* The Postal Service acknowledges that UPS tries to address the omissions by imputation, but asserts that imputation is typically used to fill in a limited number of missing values for a specific variable, rather than all values for four key volume variables based on data outside the Form 3999 data set. *Id*. at 3-4.

The Postal Service also presents the results of a number of tests of UPS's imputations and asserts that the results show that the imputations are biased and inaccurate. *Id*. at 4-12. The Postal Service asserts that even if the predicted values of the volumes were better, "serious econometric problems remain with the proposed procedure." *Id*. at 12. These include, among others, unreliable inferences about the estimated coefficients because t-statistics will be overstated; severe multicollinearity; and "operationally infeasible" marginal times. *Id*. at 12-15.

E. Reply Comments on the National Form 3999 Model

UPS observes that the need to impute data is the principal basis for the Postal Service's and Amazon's criticisms against acceptance of the National Form 3999 model. July 22 UPS Reply Comments Attaching Neels Report at 4. It asserts that what they view as the model's largest problem is "a problem of the Postal Service's own creation that the Commission may easily and quickly correct." *Id*. Moreover, UPS states that a strength of the National Form 3999 model is its ability to update or re-estimate once the Postal Service begins collecting accurate parcel volume data. *Id*. at 9.

UPS also asserts that the National Form 3999 model cannot be considered in isolation; instead, it suggests that "its modest limitations" must be weighed against Proposal Thirteen's significant weaknesses. *Id*. at 12. The latter include, according to UPS, the "indefensible segregation of so-called 'regular' delivery time from parcel delivery time." *Id*.

F. Modified Proposal Thirteen

In Modified Proposal Thirteen, UPS increases the size of the Proposal Thirteen deviation parcel/accountable cost pool and decreases the regular delivery cost pool based on the variability for DOIS parcels when these volumes (and the corresponding square and multiplicative interaction terms) are inserted into the Postal Service's proposed Regular Delivery regression. Following modification of these cost pools, UPS uses the same Regular, Deviation Parcel/Accountable, and In-receptacle Parcel Delivery regressions and data as the Postal Service. June 8 Neels Report at 43.

UPS states that if the Commission is unwilling to accept the National Form 3999 model, the Commission should accept Modified Proposal Thirteen instead. *Id.* at 48.

G. Comments on Modified Proposal Thirteen

1. Amazon

Amazon asserts that Modified Proposal Thirteen is too defective to use because it relies on parcel volume data that "all parties and all of their experts (including Dr. Neels) agree are of very low quality." Amazon Comments on June 8 Neels Report at 2. Amazon also asserts that many of the explanatory variables are correlated with each other. *Id*. It concludes that poor data quality and multicollinearity of the explanatory variables "hopelessly obscure" the causal effect, if any, of parcel volumes on regular delivery costs. *Id*. at 2-3.

2. Postal Service

The Postal Service states that UPS mistakenly asserts that parcels should be included in the regular delivery equation because city carriers simultaneously handle several mail streams at different points of the day. Postal Service Comments on June 8 Neels Report at 4. The Postal Service argues that it definitively demonstrates that simultaneous handling of multiple mail streams is not a sufficient justification for

including parcels in the Regular Delivery model. *Id*. It asserts that estimation of separate parcel and accountable variability equations is entirely consistent with carriers handling multiple mail streams throughout the day.

Moreover, the Postal Service contends that UPS fails to demonstrate that parcels materially or significantly affect regular delivery time. *Id*. The Postal Service also asserts that "…UPS continues to put forth the red herring that the Postal Service is asserting that there [is] absolutely no possible operational relationship between parcels and regular delivery." *Id*. Instead, the Postal Service asserts its approach is not predicated on an assumption that there is absolutely no possible relationship between parcel mail and the other mail streams, but on the practical reality that if there is a relationship, it is relatively small and is very difficult to estimate accurately. *Id*.

H. Reply Comments on Modified Proposal Thirteen

UPS asserts that Modified Proposal Thirteen addresses "the most glaring flaw" in Proposal Thirteen by recognizing and accounting, at least in part, for the fact that regular delivery time is sensitive to parcel volumes. July 22 UPS Reply Comments Attaching Neels Report at 18. It asserts that the exclusion of parcels is not supportable, and that UPS demonstrates using econometric analyses that parcel delivery has "a statistically significant non-zero effect on regular delivery time." *Id*. UPS, therefore, asserts that neither the Postal Service nor Amazon have provided a compelling reason to reject Modified Proposal Thirteen. *Id*. Moreover, it asserts that temporary adoption of Modified Proposal Thirteen while the Postal Service collects better data "is a far superior option to adopting Proposal Thirteen itself." *Id*.

IV. COMMISSION ANALYSIS

A. Summary of Conclusions and Findings

The Postal Service and UPS have proposed two distinct econometric approaches to modeling city carrier volume variability in this docket.[21] The Postal Service's Proposal Thirteen approach divides total street time into seven time pools. It uses the time in three of these time pools to develop the relevant volume variabilities of mail shapes in three regression models: Regular Delivery, In-receptacle Parcel Delivery, and Deviation Parcel/Accountable Delivery. UPS's National Form 3999 approach, in contrast, develops variabilities using a single time pool, with no further disaggregation.[22]

To approve a proposed change in an analytical principle, the Commission must find that the proposed change improves the quality, accuracy, or completeness of the data (or the analysis of data) in the annual periodic reports the Postal Service files with the Commission. 39 C.F.R. § 3050.11(a). In addition, in light of the competing proposals raised in this docket, the Commission must determine which proposal offers greatest improvement over the current method.

The Commission finds that Proposal Thirteen is an improvement over the current methodology in all three respects. The current methodology was developed using data from a special study that is now more than 10 years old. By utilizing two operational databases, Proposal Thirteen not only incorporates more recent data, but incorporates data which reflect the substantial changes in city carrier operations that have occurred since the current model was adopted, such as route restructurings, expanded

[21] UPS also proposes Modified Proposal Thirteen, which is not a distinct econometric approach from Proposal Thirteen.

[22] Technically, UPS develops three time pools: Regular Delivery, Accountables, and Box Delivery. However, all shape variabilities are developed from the Regular Delivery time pool, which accounts for 98.49 percent of street time. *See* June 8 Neels Report at 45, Table 16.

deployment of FSS equipment, changes in mail volume and mail mix, and the introduction of city carrier assistants.

In addition, by taking advantage of the annual Form 3999 evaluation, Proposal Thirteen significantly reduces the amount of data that must be collected in special studies. Specifically, the special studies are only necessary to collect data on collection mail, accountable mail, deviation parcels, and in-receptacle parcels. Moreover, with the proposed change, the number of routes included in the special studies increases; the data collection process is simplified; control and review of data collection is enhanced; and the consistency of carrier participation is improved. *See* Street Time Report at 32. These changes lead to a larger initial sample size and a lower attrition rate for routes in the sample.[23] As a result, more observations are included in the regressions, and this contributes to results which are more likely to be reasonable and reliable; exhibit less multicollinearity and provide greater statistical accuracy; and are less likely to exhibit undetectable errors than the current methodology.[24]

Notwithstanding the notable improvement Proposal Thirteen represents in terms of quality and completeness of data and accuracy of results, questions remain as to whether it fully captures the effects of volume on street time costs. In particular, UPS's analysis suggests that the Postal Service's calculations do not thoroughly reflect actual interactions between regular delivery and parcel delivery. In its National Form 3999 model, UPS proposes an alternative approach that jointly models regular and parcel delivery specifically capturing these interaction effects.

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[23] The attrition rate for a study measures the number of participants that provide data at the beginning of the sample but stop providing data by the end of the sample. The Postal Service notes that the attrition rate was low, and that the FY 2013 Collection Mail Study "captured 98.6 percent of the possible route days." Street Time Report at 32. The attrition rates for the Docket No. R2005-1 Street Time Study were upwards of 15 percent. Docket No. R2005-1, Opinion, Appendix I at 15.

[24] For example, the full quadratic version of the Proposal Thirteen model exhibits less multicollinearity than the full quadratic version of the current model, even though both models have approximately the same number of explanatory variables. Street Time Report at 71, Table 27; 75.

The Commission concludes that the general approach UPS advocates has the potential to result in more accurate variability estimates. However, parcel and collection volume data are either unavailable or not sufficiently accurate for use in UPS's National Form 3999 model. Despite UPS's efforts to impute the necessary data, there is a high degree of measurement error in the model and no estimated variability for accountable mail. Given these data limitations, the Commission cannot accept the National Form 3999 model. Nevertheless, UPS's unified approach warrants further consideration to determine whether it can lead to further improvements in the quality, accuracy, and completeness of city carrier street time cost attribution. In Part IV.D of this Order, the Commission directs the Postal Service to examine the capabilities of its data systems to evaluate whether sufficient data can be generated to examine whether a single model can provide improved estimates of variability and report the results to the Commission.

In the remainder of this Order, the Commission compares the two competing approaches, starting with a discussion of city carrier operations. The Commission then evaluates the accuracy and suitability of the data used in each proposed cost model, and discusses the impact of the quality and availability of data on each approach. The Commission also analyzes UPS's proposed alternative approach, Modified Proposal Thirteen.

B. Operational Analysis

1. Background

This docket is another chapter in the long history of determining attribution of city carrier street time costs.[25] In the early engineering models, each carrier activity (such as load, access, and route time) was analyzed separately, without considering possible interactions. In regression analysis, models estimate how one variable (referred to as

[25] *See infra* Appendix C for an extended discussion of the historical development of city carrier cost attribution models.

the dependent variable) changes in response to changes in causal variables (referred as the explanatory variables). Operational analysis is necessary to provide a rational basis for model selection. For this reason, the first step in a postal delivery regression analysis is to examine delivery operations to understand the causal relationship(s) between explanatory variables (such as mail shape volumes) and the dependent variable (in this case, city carrier street time). This assists in the development of cost attribution because cost causation is a crucial aspect of cost attribution.

The current model and the competing Postal Service and UPS models rely on regression analysis. However, each model reflects a different view of operations as it relates to parcels. In addition, the UPS model reflects a view of allied activities that differs from the current and proposed Postal Service models.

As under the current model, Proposal Thirteen is based on a view of city carrier operations that separates regular delivery, parcel delivery, and allied activities. Regular delivery refers to the delivery of non-parcel mail pieces, including letters and flats. Parcel delivery is the delivery of parcels, which is further divided by the Postal Service into parcels delivered to a customer's receptacle (in-receptacle parcels) and parcels that do not fit into the customer's mail receptacle (deviation parcels). *See* January 12 Response to CHIR No. 1, question 5a. Allied activities are activities undertaken by city carriers that do not directly involve the delivery of the mail. These activities include travel time to and from route segments as well as breaks and lunch periods.

Proposal Thirteen retains and expands on the method of estimating a variability for each shape by regressing delivery time (*i.e.*, the sum of load, access, and run times) against shape volumes. Street Time Report at 26, 89-90. In contrast, UPS proposes a cost model based on the concept that carrier activities related to regular delivery, parcel delivery, and allied operations are not performed separately and, therefore, should be modeled together.

Because the Postal Service concludes that time incurred for parcel delivery operations is independent from time incurred for regular delivery operations, the Postal Service establishes separate models for separate activities: Regular Delivery, In-receptacle Parcel Delivery, and Deviation Parcel/Accountable Delivery.[26] Street Time Report at 19-25. UPS disagrees with the Postal Service's position that city carrier operations should be segmented in this way. It asserts:

> Over the course of the day, a letter carrier handles a number of different mail streams, including parcels, and those streams are intermingled. It is implausible that special studies involving mail carriers holding timers can accurately measure the discrete amount of time spent dealing with any one of those mail streams.

June 8 UPS Comments Attaching Neels Report at 6.

2. Interaction of Parcel Delivery Activities and Regular Delivery Activities

The primary difference between the approaches of the Postal Service and UPS centers on whether parcel delivery activities are fully separable from regular delivery activities. The Postal Service separates parcel delivery from regular delivery and employs two parcel models: one for in-receptacle parcels and one for deviation parcels/accountables. UPS employs a single model for all mail shapes, including deviation parcels/accountables and in-receptacle parcels.

i. Deviation Parcels

Deviation parcels and accountables both require special activities from city carriers. As previously explained, deviation parcels do not fit into a customer's receptacle. Accountable mail requires the carrier to obtain the signature of the

[26] Allied delivery operations are not modeled. Attribution is determined outside of the three models.

addressee or addressee's agent upon receipt.[27] Both of these involve activities that are distinct from regular delivery activities, as they "require a carrier deviation" for delivery. Street Time Report at 86.

The Postal Service considers the delivery of deviation parcels/accountables a distinct and separate action from regular delivery. As part of the Form 3999 evaluation, the manager keeps track of the delivery time associated with deviation parcels/accountables. Because these pieces require distinct carrier action, the Postal Service asserts that the time associated with the particular handling required can be discretely measured. *Id.* at 88. In the FY 2014 Parcel/Accountable Study for Proposal Thirteen, the Postal Service found that the average route time spent delivering deviation parcels/accountables closely matched the amount of time measured during the annual Form 3999 evaluation. *Id.* at 16 n.4.

According to UPS, the question concerning separation of deviation parcels/accountables is not whether the direct time caused by these items can be measured. Instead, UPS asserts that the volume of deviation parcels/accountables can impact carrier operations in ways that go beyond the direct time associated with their delivery. UPS states:

> [T]he Postal Service's approach rests upon a number of untested assumptions. It assumes, first, that the presence, absence, or quantity of parcels and accountables has no effect on regular mail delivery…At the same time, this approach assumes that the delivery of regular mail has no effect on the time required to deliver parcels and accountables.

March 18 UPS Comments Attaching Neels Report at 10.

The Commission finds that from an operational perspective, deviation parcels/accountables require distinct carrier activities. However, UPS's assertions

[27] *See* http://about.usps.com/publications/pub32.pdf at 6.

concerning the potential impact of deviation parcel/accountable volumes on other delivery activities merit further investigation to test their validity. For this and other reasons, the Commission directs the Postal Service to file a report concerning the development of a larger and more comprehensive data set in Part IV.D.

ii. In-receptacle Parcels

In the current methodology, the delivery time associated with in-receptacle parcels is estimated as part of the Regular Delivery model.[28] As previously described, these parcels are modeled separately from the Regular Delivery model in Proposal Thirteen.

As a management tool to allocate resources, the Postal Service measures in-receptacle parcel delivery time with regular delivery time. Street Time Report at 17-18. The Form 3999 evaluation data does not include a specific measurement of the delivery time or volume of in-receptacle parcels, but subsumes in-receptacle parcel time within regular delivery time.[29] UPS criticizes the separate modeling of in-receptacle parcels in Proposal Thirteen because it asserts that the Postal Service lacks an operational justification for the separate modeling. March 18 UPS Comments Attaching Neels Report at 10. In response, the Postal Service states that due to data availability, the separate modeling of in-receptacle parcels produces the most accurate estimate of in-receptacle parcel delivery time. *See* Bradley Analysis of March 18 Neels Report at 10; Postal Service Reply Comments at 20. Although the Commission agrees that the Postal Service's approach does not have a strong operational justification, as discussed later in this Part, the Commission finds that the separate modeling of in-receptacle parcels allows the Postal Service to generate estimates of in-receptacle delivery time

[28] In the current methodology, the term small parcels is used to refer to in-receptacle parcels. *See* Docket No. R2005-1, USPS-T-14.

[29] In the Form 3999 evaluation, in-receptacle parcel time is measured as part of sector segment time, which is a subset of regular delivery time under the terminology used in the evaluation.

that are more accurate than the estimates generated by the current model. This approach results in an improvement over the current model because the variabilities for these parcels generated in the current methodology have weak statistical significance. Docket No. R2005-1, Opinion at 69-70.

3. Interaction of Allied Time and Total Delivery Time

Whether allied operations should be viewed as separate from regular delivery activities is the second difference between the Postal Service and UPS approaches. As explained previously, allied operations are activities that do not directly involve the delivery of mail, including travel time to and from the route segments, breaks, and lunch periods. As with deviation parcels, these activities are identified during the Form 3999 evaluation when Postal Service managers measure the allied time for a route. Many allied activities are considered fixed with respect to volume. For example, regardless of the volume to be delivered on a given day, the expectation is that carriers will spend the same amount of time traveling to and from the route.

Given that allied activities are measured separately during the Form 3999 evaluation and not expected to vary directly with volume, the Postal Service accounts for allied activities separately. In the National Form 3999 model, UPS estimates the variability of allied activities as part of its unified delivery equation.

UPS has two primary criticisms for the Postal Service's approach to allied activities. First, UPS is concerned that the Postal Service "only recorded times for allied activities once per route during the 'Form 3999' process." March 18 UPS Comments Attaching Neels Report at 16. UPS observes that as a result, the Postal Service must "subtract the one-time data on allied activities from the actual data collected on volumes for each route day, even though the time spent on allied activities surely varies from route day to route day." *Id*. Second, UPS is concerned that there is a specific allied cost pool for network travel time. If a route has higher volumes and requires more pivoting than normal, additional carrier time will be spent traveling between route

sections. The Postal Service assumes that this allied activity has the same variability as regular delivery. UPS criticizes this assumption, stating that "[t]he Postal Service should not be permitted to embed in its model such assumptions, particularly those that are susceptible to being tested by the data." *Id*. at 18-19.

Under the current approach, allied time is removed from the Regular Delivery regression. Docket No. R2005-1, Opinion at 57. In this way, Proposal Thirteen's approach is consistent with the current approach. Nevertheless, given adequate data, a unified delivery equation like the one advocated by UPS could capture the empirical variability of allied activities as part of the overall variability estimates. This approach could eliminate the need to make assumptions about the effect of changes in volume on allied time. For this and other reasons, the Commission directs the Postal Service to file a report concerning the development of a larger and more comprehensive data set in Part IV.D.

In the remainder of this Part, the Commission discusses the role of data in econometric models and how, in the absence of complete data on city carrier street operations, Proposal Thirteen and the alternatives presented by UPS include compromises which, while necessary, are nevertheless detrimental to the confidence in the resulting estimates.

C. Data and Model Specification Analysis

1. Data Sources and Data Quality

Data form the basis of all econometric models. That data must be comprehensive and accurate for an econometric model to produce reliable estimates. To measure the issue of interest in this case — the variability of city carrier costs with respect to volume — the basic data required are mail volume and delivery time. To understand and model how volume impacts time spent on various carrier activities, all mail volume for a given delivery day in each ZIP Code needs to be measured

accurately. Further, the data detailing the time on the route need to align with the econometric model design.

The Postal Service gathers data on both of these subjects. These data sources are not without limitations, which have an important impact on measuring and modeling delivery costs.[30] For example, DOIS provides comprehensive and accurate volume information for each route on a national and daily basis for four of the eight mail shapes in the Proposal Thirteen model. The volume data in DOIS are derived from two sources. End-Of-Run piece counts from automated mail processing equipment provide delivered volumes of DPS letters, FSS flats, and a portion of cased letters and flats. Sequenced mail, which does not require casing, is counted as one piece per stop on each route to which the sequenced mail is delivered. DOIS also includes the volume of some cased mail and sequenced mail delivered through a manual measurement of the number of feet of mail, which is converted to pieces of mail by applying a conversion factor.[31] No commenters question the reliability of this method and the resulting data.

DOIS does not record collection, accountable, in-receptacle, or deviation parcel mail volumes. While DOIS counts some parcels, its method for counting parcels is less rigorous, and the parcel data from DOIS are not usable for econometric analysis because DOIS does not distinguish between in-receptacle and deviation parcels. This leaves a gap in information for in-receptacle parcel, deviation parcel, collection, and accountable volumes. There is no nationwide, daily, route-specific source of data for these four mail shapes. As a result, the Postal Service engaged in two special collection efforts to address the absence of data for these mail shapes.

Once volume data are collected, they are combined with time data from the same period to form the empirical basis for an econometric model. The Postal Service

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[30] *See generally* Docket No. RM2011-3, Scoping Study Report of the United States Postal Service, May 25, 2012 (Scoping Study).

[31] *See* United States Postal Service Management Instruction PO-610-2007-1, Piece Count Recording System, July 27, 2007, at 4-7.

records street time data for city carriers in DOIS for each route each day. The street time hours contained in DOIS are considered reliable because they are generated through the Time and Attendance Collection System database for city carriers, which is the basis for the Postal's Service's payroll. However, the DOIS data provide total street time and do not disaggregate street time into the pools for Regular Delivery, Parcel and Accountable Delivery, and In-receptacle Delivery that are used in Proposal Thirteen's three regression equations.

The Postal Service uses Form 3999 evaluation data for allocation of time to disaggregated activities. For example, in the Regular Delivery model, the dependent variable is regular delivery time. The Postal Service calculates regular delivery time by subtracting Form 3999 allied time[32] from DOIS total street time. Street Time Report at 42. One drawback to the Form 3999 database in terms of its application to costing is that it does not contain parcel data in the structure required for the Postal Service and UPS models. The other drawback is that each route is evaluated no more than once per year, so the Form 3999 database alone is not sufficient to develop a daily delivery model.

UPS's National Form 3999 model uses Form 3999 data for both volume and total time measurements. Most of the volume measurements in the Form 3999 data set are derived from DOIS. The notable exception to this is the deviation parcel volume, which is measured by the manager during the evaluation process. The National Form 3999 model uses this deviation parcel volume in its analysis. However, UPS must also impute substantial parcel volume data because the Form 3999 database lacks a substantial portion of parcel volume data needed for its model.

[32] This definition of allied time from Form 3999 includes deviation and accountable parcel delivery time.

In the remainder of Part IV.C, the Commission analyzes the data underlying Proposal Thirteen and the UPS alternative, and discusses how the data affect the design and reliability of these approaches.

2. Measurement of Regular Delivery Time

The Postal Service calculates delivery time for the regular delivery equation by subtracting the Form 3999 allied time from the daily DOIS total street time for each observation in the sample. *Id.* A key assumption underlying this calculation is that the one observation of allied time per route in the Form 3999 data is an accurate representation of the time spent on allied activities for each day of the sample period. UPS criticizes this approach as "akin to subtracting apples from oranges" on the grounds that it involves different days and different databases. March 18 UPS Comments Attaching Neels Report at 16. Specifically, the allied time is from the Form 3999 database and the daily street time is from DOIS. The Form 3999 evaluation day does not coincide with any of the twelve DOIS observation days. *Id.* at 15-16; March 18 Neels Report at 10-11.

There are two specific data quality issues concerning the Regular Delivery model: one pertaining to deviation parcel time measurement and the other pertaining to in-receptacle parcel time measurement. For deviation parcels, the Postal Service presents deviation parcel/accountable time as one of the allied activities in the Form 3999 database. Deviation parcel time was also separately measured each day in the FY 2014 Parcel/Accountable Study. The data from the special study show that parcel volumes and time vary by day and by route.[33] Because parcel time varies by day and route, using a single observation of parcel time, along with single observations of other allied activities, to calculate regular delivery time for several days creates the potential

[33] The Postal Service also details the large inter-quartile ranges for deviation parcels. *See* Street Time Report at 98, Table 40.

for measurement error of regular delivery time (the dependent variable) in the proposed Regular Delivery regression.

The second issue concerns the lack of measurement of in-receptacle parcel time. In-receptacle volumes are not part of the Proposal Thirteen regular delivery equation. However, in-receptacle delivery time is not distinguished from regular delivery time in the Form 3999 evaluation, and the Postal Service has no available means of identifying and removing the corresponding time from regular delivery time. The Postal Service acknowledges that:

> The implementation of the model specification relies upon actual data and it is quite likely that the Form 3999 data mis-measures in-receptacle delivery time. To the extent the Form 3999 data does not capture all in-receptacle time, then some amount of in-receptacle time would be included in the measured regular delivery time.

Response to CHIR No. 3, question 3a. This represents another source of possible measurement error of regular delivery time in the Regular Delivery regression.

The Postal Service contends that this type of error is not a significant problem. It states that both deviation and in-receptacle parcel measurement errors are not likely to be correlated with any of the explanatory variables and do not harm the statistical reliability of the variabilities generated by the model. *Id*. question 2b. It notes that dependent variable measurement error would not bias the estimates of mail shape coefficients, although it would increase the standard errors of coefficient estimates. Street Time Report at 46.

UPS asserts that the measurement error associated with allied time is problematic because the measurement error is correlated with parcel volumes, which are in turn correlated with the explanatory variables in the Regular Delivery model.[34]

[34] March 18 UPS Comments Attaching Neels Report at 15-16; March 18 Neels Report at 10-11; *see* Response to CHIR No. 3, question 2.

This conclusion is based on an analysis that relies on DOIS parcel data. The Commission finds that UPS's argument is insufficient to warrant rejection of Proposal Thirteen, as the DOIS parcel data that UPS uses are flawed. Moreover, UPS identifies the under-attribution of costs to parcels as "the most serious shortcoming of the [Proposal Thirteen] approach." June 8 Neels Report at 43. However, Proposal Thirteen increases the attribution of city carrier costs to parcels when compared to the current methodology. *See* June 8 Neels Report at 42, Table 14.

The Commission acknowledges that the use of one observation per route for allied time (including deviation parcel time) instead of a daily observation is not ideal. However, the measurement of allied time in the current model exhibits more significant measurement errors than those appearing in Proposal Thirteen, and thus the use of Form 3999 data in Proposal Thirteen is a meaningful improvement over the data currently used.[35]

In addition, separating parcel delivery from regular delivery raises the possibility that omitted-variable bias[36] could compromise the reliability of the Regular Delivery model. To test for omitted-variable bias, the Commission ran three regressions, each of which is a variation on the Postal Service's Regular Delivery model. In the first and second regression, in-receptacle and deviation parcels were separately tested, and in the third regression both were tested simultaneously. Appendix B further describes these regressions, and provides a detailed discussion of this issue. While the Commission cannot definitely determine whether omitted-variable bias exists in the Regular Delivery model, the Commission concludes that a larger data set would likely

[35] For the Docket No. R2005-1 Street Time Study underlying the current methodology, carriers were required to measure allied time via scans, similar to the FY 2014 Parcel/Accountable Study in this docket. Due to the complexity of self-reporting various delivery activities by scanning 1 of 36 different barcodes, the Docket No. R2005-1 Street Time Study data exhibited coefficients of variation of up to 10 percent and missing data. *See* Docket No. R2005-1, Opinion at 60-63.

[36] In economic literature, omitted-variable bias is present in a model if the regression parameters of the omitted variables are significantly different from zero and all the terms which comprise omitted variables highly correlate with the terms which comprise other explanatory variables. *See, e.g.,* Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* 96-97 (3rd ed. 2006).

allow for a more accurate test of whether in-receptacle parcels and deviation parcels should be included in the Regular Delivery model. Appendix B at 3-4, *infra*.

3. Measurement of Parcel Time

The dependent variable for the Postal Service's Deviation/Accountable Parcel model and the In-receptacle Parcel model is the respective delivery times of these parcels as measured by the FY 2014 Parcel/Accountable Study. As part of the study, carriers scanned specified barcodes to record the beginning and ending times associated with delivering a parcel. The total delivery time for each parcel is measured as the difference between the initial scan and the final scan. However, this time includes the time required for the carrier to make the initial and final scans, which would not have occurred outside of the special study and should not be included in an estimate of parcel delivery time. To account for the scan time, the "elapsed time for each activity pair was reduced by 12 seconds." Street Time Report at 99.

In-receptacle parcels are delivered as part of a carrier's normal delivery activities, at times bundled together with letters and flats. By instructing carriers to perform a separate delivery action for all in-receptacle parcel deliveries, the study did not fully reflect the ordinary process of delivery.[37] Carriers who do not have space constraints typically incorporate in-receptacle parcels into a bundle with other mail and deliver the parcel with the other mail whenever the size of the parcel and the mail receptacle make it feasible to do so. When carriers have space constraints, they will deliver an in-receptacle parcel separately from other regular delivery mail. Response to CHIR No. 2, question 5. In contrast, the FY 2014 Parcel/Accountable Study required all carriers to deliver regular mail first and then in-receptacle parcels. As part of the study, the

[37] A carrier would not know whether a small parcel would fit into the customer's mail receptacle until arriving at the stop. If the parcel fit into the customer's mail receptacle, it was recorded as an in-receptacle parcel. Otherwise, it was recorded as a deviation parcel. This is the same criterion the current model uses to distinguish between small and deviation parcels. *See* Docket No. R2005-1, USPS-T-14 at 22; Street Time Report at 15.

carriers were required to scan the barcode indicating the beginning of an in-receptacle parcel delivery, insert the parcel into the customer's receptacle, and stop the clock by scanning a barcode indicating the delivery mode. January 12 Response to CHIR No. 1, question 23.

The Public Representative and UPS raise concerns about the Postal Service's method of removing study scan time from in-receptacle and deviation parcel time. In the FY 2014 Parcel/Accountable Study, the Postal Service subtracts 12 seconds of study scan time from each in-receptacle and deviation parcel delivery. This does not reflect the reality that study scan times vary from delivery to delivery. Moreover, the estimate of scan time is based on supervisors' estimates of the additional street time participating carriers incurred recording the parcel deliveries, compared to a similar day when carriers did not conduct study scans. These estimates were provided after the conclusion of the study. Response to CHIR No. 2, question 7. Consequently, this method potentially introduces an error in the measurement of both parcel times.

The Public Representative criticizes the Postal Service's estimate that 12 seconds is the amount of time associated with scanning barcodes for the study. PR Comments at 9-10. She proposes that a better estimate of scan time would be 6.23 seconds, the estimated time used for delivery confirmation scans. *Id*. at 10.

The Postal Service acknowledges that the scan time estimate "may not be perfect," but contends that the relative unfamiliarity of making the special study scan, plus the added complexity of finding a special card to make the scan and push additional buttons on the scanner, make it likely that scan time is closer to 12 seconds than 6.23 seconds. Postal Service Reply Comments at 9-11.

Ideally, the study data would include an accurate assessment of the scan time's impact on each parcel delivery. The Commission acknowledges the challenges associated with collecting data with that level of precision in the real world. The Postal Service's explanation for the difference from the delivery confirmation scan is plausible.

In addition, the sensitivity analysis presented by the Postal Service shows that using 12 seconds rather than 6 seconds has a minimal effect on the estimated variabilities. *See id*. at 10-11.

Although Proposal Thirteen's approach has limitations, it improves the accuracy of the estimated marginal time for parcels as compared to the current approach. The potential for error in measuring parcel delivery times (in each of the parcel models) is a risk introduced by the need to use separate models to produce reliable estimates of parcel variabilities. In the absence of reliable daily parcel volumes, the Postal Service relies on a sample. The volume of in-receptacle parcels is small relative to letters and flats, which contributes to poor statistical results when included in the current Regular Delivery model. The Postal Service separately models in-receptacle parcels because the statistical results were problematic when in-receptacle parcels were included in the Regular Delivery model. The results of the In-receptacle Parcel model are statistically significant, a threshold that is difficult to achieve using the current methodology.[38] The increase in marginal time for these parcels in Proposal Thirteen suggests that the current methodology may have produced an inaccurate estimate.

4. Sample Period

For the FY 2014 Parcel/Accountable Study, the Public Representative states that using data from 12 consecutive days from the routes in the sampled ZIP Codes is appropriate, but expresses concern that the sample period does not capture variation in parcel volume over the entire year. PR Comments at 7-8; *see* March 18 Neels Report at 14. The Postal Service responds that it selected a period of time relatively free from seasonal variations so that the sampled time period is representative of an average delivery day. Postal Service Reply Comments at 7.

[38] The current variability estimate for small parcels (the equivalent of in-receptacle parcels) was negative using the "full" quadratic model, which contained all of the interaction terms. Consequently, the Postal Service sponsored a "restricted" quadratic model, which excluded all of the interaction terms, to achieve reasonable results. Docket No. R2005-1, USPS-T-14 at 37-38.

UPS asserts that the analysis should cover a time period long enough to capture substantial changes in route structure, which are a direct reflection of sustained changes in volume. UPS claims that neither the current model nor Proposal Thirteen meet this criterion. *See* June 8 Neels Report at 10. In response, the Postal Service and Amazon assert that 12 days of data from 300 ZIP Codes provides more information and produces more reliable results than UPS's cross-section regression. In support, the Postal Service notes that over half of the estimated coefficients from UPS's cross-section model[39] cannot be distinguished from zero. Bradley Analysis of March 18 Neels Report at 5-7. Amazon runs separate cross-section and time-series versions of the Postal Service's Regular Delivery regression. It concludes that while most of the explanatory power of the Postal Service's regression comes from the cross-section version, a time-series version adds significant explanatory power. July 10 Lundblad Declaration at 23.

The Commission supports the development of reliable operational data for each ZIP Code-day which would allow all days within a year to be used to estimate volume variabilities. This would increase the Postal Service's ability to measure both the short- and long-term effects of changes in volume. Because more comprehensive data are not available, the Commission finds Proposal Thirteen's sample period acceptable. The duration of the sample used in Proposal Thirteen is the same as in the study underlying the current methodology, so maintaining the same duration does not impact the Commission's assessment under 39 C.F.R. § 3050.11(a). Moreover, the proposed study was successful in obtaining data largely comprised of consecutive days. More than 12 percent of total daily observations were missing in the special study used in the current methodology, whereas only 1.4 percent of total daily observations were missing in the Proposal Thirteen special study.[40] Thus, the updated data used in the Proposal

[39] *See* March 18 Neels Report at 26. UPS presents a cross-section analysis using Postal Service data in this report.

[40] *Compare* Docket No. R2005-1, Opinion, Appendix I at 18, *with* Street Time Report at 36, Table 11.

Thirteen approach improves quality, accuracy, and completeness of the data supplied to the Commission in accordance with 39 C.F.R. § 3050.11(a).

5. Concerns Regarding the National Form 3999 Model

A key aspect of UPS's National Form 3999 model is its reliance on imputed data for in-receptacle parcel, deviation parcel, and collection mail volumes. UPS explains that utilizing actual data for these inputs is preferred, yet reliable volumes for these shapes are not currently collected by DOIS or Form 3999 evaluations. July 23 Neels Report at 35.

The Postal Service performs several tests on UPS's imputed data and finds that the imputation method does not accurately replicate the volumes that were actually measured on the sampled routes in the FY 2014 Parcel/Accountable Study, results in high standard errors, and produces estimates that are biased and inefficient. Bradley Analysis of June 8 Neels Report at 5-12. The Postal Service and Amazon both present evidence that UPS's imputation method introduces additional multicollinearity into its model. *Id*. at 13; July 10 Lundblad Declaration at 3.

As Amazon points out, high multicollinearity can produce estimates which are not stable with respect to minor specification changes and thus should be avoided. July 10 Lundblad Declaration at 3. UPS's method of imputing data also introduces a high level of measurement error in the imputed explanatory variables. *Id.* at 8. The parameters developed in the imputation are estimates, and each one has a range of values which can be forecast for every observation and still be considered accurate. However, UPS treats the values of the three imputed variables as exogenous or fixed in repeated samples, even though the values of these variables are estimates, and therefore not fixed in repeated samples. By not accounting for the error associated with each estimated forecast parameter, the National Form 3999 model introduces a high level of measurement error in its explanatory variables.

Because actual volume data for deviation parcels/accountables, in-receptacle parcels, and collection mail that match all observations in UPS's single delivery model are not available, the Commission is unable to test reliably whether UPS's variable estimates by shape are biased as a result of imputing data for explanatory variables. However, because the model has three shape variables with measurement error, it is more likely its shape coefficient estimates are biased than if there had been only one explanatory variable with measurement error.

Another issue with the National Form 3999 model is that it does not include a variability for accountable mail. In the supplemental report, UPS explains why it does not compute a variability for accountable mail. June 8 Neels Report at 28, 37. UPS states that it was "unable to develop an acceptable imputation methodology for accountable mail volume...." *Id.* at 27. It proposes to use Form 3999 data to form a cost pool for the total cost of accountables. *Id*. at 46. It then assumes that 100 percent of the accountable time is variable. *Id*. at 45. It notes that:

> [I]t is important for the Commission to think carefully about what level of resources and review time it makes sense to devote to this relatively small element of city carrier operations, and about how best to make tradeoffs between improving the accuracy of cost attribution for this activity and improving cost attribution for the larger and more rapidly growing mail streams.

Id.

The Commission finds the need to impute volume data that are not otherwise available substantially undermines the reliability of the National Form 3999 model. Present data shortcomings cause the model to have high multicollinearity and a high probability of biased estimates. In addition, the Commission finds the lack of estimated variability for accountable mail problematic. Consequently, the Commission finds Proposal Thirteen likely offers greater improvements to the quality, accuracy, and completeness of reported data and the association analysis than the National Form 3999 model. Nonetheless, the Commission observes that data concerns inherent in the

National Form 3999 model would be substantially mitigated if comprehensive data for parcel, accountable, and collection mail volumes were available.

6. Other Issues

i. Modified Proposal Thirteen

Modified Proposal Thirteen transfers 2.9 percent of directly attributable street time costs from the regular delivery cost pool to the deviation parcel/accountable cost pool. *Id.* at 43. It then applies the variabilities by shape estimated in the Postal Service's proposed regressions to the reduced regular delivery and increased parcel deviation delivery cost pools. *Id.* This results in higher attributable costs for deviation parcels/accountables and lower attributable costs for each regular delivery mail shape. *Id.*

UPS justifies this transfer of costs based on its position that the current model under-attributes delivery time to deviation parcels. *Id*. It explains that the magnitude of the transfer (2.9 percent) equates to the estimated variability of DOIS parcels when these volumes (and the corresponding square and multiplicative interaction terms) are inserted into the Postal Service's Regular Delivery model. *Id.*; *see* March 18 Neels Report at 10.

UPS acknowledges the poor quality of DOIS parcel data, but contends the poor data understates the variability of deviation parcels, and that better data would result in higher parcel volume variability. March 18 Neels Report at 8.

The Commission finds that Modified Proposal Thirteen does not offer greater improvement over the current method than Proposal Thirteen for several reasons. UPS does not provide quantitative evidence that the costs attributed to deviation parcels are too low, nor does it provide a sufficient mathematical justification for Modified Proposal Thirteen. Moreover, the regression used to develop this modification is dependent on unreliable DOIS parcel volumes. In addition, the application of this method does not

reveal a meaningful link between the additional costs that would be attributed to deviation parcels if they were included in the Regular Delivery model and the additional costs that would be attributed to deviation parcels by shifting a percentage of costs equal to that variability from the regular delivery pool to the deviation parcel pool.

ii. Variability at the Product Level

PostCom states that it believes the results of the study of parcel and accountable delivery can be improved by separately breaking out costs for each product. *See* PostCom Comments at 2. By noting that the study does not identify the products to which attributable street time costs of parcels and accountables are distributed, PostCom appears to suggest that the study should have produced unique variabilities for each product. However, the data to develop variabilities at this level of disaggregation are not available. Furthermore, in the absence of evidence that delivery costs are driven by a mail piece's product designation, as opposed to its shape, the Commission finds that such disaggregated variabilities would not improve the models. As long as the distribution keys used to assign the attributable costs for each shape to products are properly measured, there is little advantage to developing variabilities at a more disaggregated level.[41]

iii. Approach to Analyzing Outliers

UPS uses the statistical transformation known as Winsorization to address the problem of potential outliers in its analyses of the entire Form 3999 database, which it asserts is necessary in light of the time constraints of the procedural schedule. June 8 Neels Report at 18. The Public Representative agrees that outliers must be addressed in some way, but questions the appropriateness of Winsorizing the Form 3999 data because this practice assumes all outlying observations are valid observations, *i.e.*,

[41] No commenter has suggested a problem with delivery distribution keys.

observations which should be included in the sample, even though they may be extreme. PR Comments on June 8 Neels Report at 4-5. The Commission does not find it necessary to address the question of the appropriateness of the use of Winsorization because it is not accepting the National Form 3999 model due to other data issues stemming from imputation of in-receptacle parcel, deviation parcel, and collection mail volumes. However, the Commission notes that historically it has considered a less mechanistic method preferable when circumstances allow.[42]

D. Conclusion and Next Steps

The Postal Service notes that its modeling approach is "based, in large part, on the practicality of accurately estimating" variability. Bradley Analysis of June 8 Neels Report at 23. Proposal Thirteen presents a risk of dependent variable measurement error in the model specification used. However, after considering the current methodology, the proposed models, and the available data, the Commission finds that Proposal Thirteen is the best available option for estimating city carrier street time variability. The Commission approves Proposal Thirteen which, for the reasons described in this Order, will improve the quality, accuracy, and completeness of city carrier street time cost attribution.

The Commission also observes that the majority of the criticisms of the UPS approach are not with model specification, but rather with the accuracy and appropriateness of the imputed data used in its model. *See, e.g.,* July 10 Lundblad Declaration at 6-21. Even the Postal Service's expert observes UPS's approach has benefits and challenges:

[42] *See* Docket No. RM2014-6, Order No. 2180, Order on Analytical Principles Used in Periodic Reporting (Proposals Three through Eight), September 10, 2014, at 15 (concerning Proposal Six, an update to highway transportation variabilities where the Commission accepted a less mechanistic method proposed by the Postal Service).

> Philosophically, I agree with Dr. Neels that there are certain advantages associated with estimating an overall "top-down" variability equation in which all variabilities and marginal costs are simultaneously estimated. In theory, such an approach could allow for econometrically testing separability. In practice, as Dr. Neel's own research has demonstrated, this can be a very difficult course. Even with 10,000 observations, Dr. Neels could not successfully overcome the problems of missing data and multicollinearity, which often plague top-down approaches.

Bradley Analysis of June 8 Neels Report at 23.

The Commission concludes that the UPS approach holds the potential to remedy many of the measurement problems that arise from the use of separate models for parcel delivery. However, available data are not sufficient to develop reliable estimates of variability using this approach. To improve the quality, accuracy, and completeness of the data used to attribute city carrier street time costs, the Commission directs the Postal Service to collect the information needed to determine whether a single model could produce improved estimates of variability. Even if the unified approach ultimately should prove unworkable, recording reliable daily volumes of collection mail and delivered parcel and accountable pieces would allow for more frequent updates of street time variability using much larger data sets while reducing or eliminating the need for expensive and time-consuming special data collection studies.

As a first step in this developmental process, the Commission directs the Postal Service to examine the capabilities of its data systems to evaluate its ability to capture and report daily machine counts of parcels for each ZIP Code. While the Postal Service's reporting systems currently do not produce daily volumes of collection mail and delivered parcels and accountables, it may be possible to do so with relatively minor modifications. For example, one of the reasons that DOIS does not currently produce reliable estimates of delivered parcels is because parcels are manually sorted to the carrier route level. However, Proposal Thirteen models delivery operations at the ZIP Code level, not the carrier route level. Therefore, it may be possible to utilize

machine-generated data from the sorting of parcels to the 5-digit level to produce volume estimates that can be used in a delivery model. These data would need to be supplemented with data from mailing statements to capture volumes that are presorted to the 5-digit level by mailers.

Similarly, it may be possible to better leverage the widespread use of next generation hand-held scanners by carriers to record the delivery of accountable mail and produce reliable volumes by ZIP Code. Reporting volumes of collection mail by ZIP Code may be more difficult to automate, but it may be possible to produce a manual estimate based on a length or weight conversion factor.

The Commission directs the Postal Service to file a report describing the steps that would need to be taken to collect each of the volume measures that necessitated special studies in this case (*i.e.*, for each ZIP Code-day: in-receptacle parcels, deviation parcels, accountable mail, and collection mail). It shall also include an estimate of the costs and time needed to implement these changes. This report is due by February 15, 2016. In addition, the Commission directs the Postal Service to include in its report a statement addressing the status of its investigation into the feasibility of updating the cost model used to assign the costs of Sunday delivery hours and parcel routes.

V. ORDERING PARAGRAPHS

It is ordered:

1. The Commission approves Proposal Thirteen which, for the reasons described in this Order, improves the quality, accuracy, and completeness of city carrier street time cost attribution.

2. The Commission directs the Postal Service to file, no later than February 15, 2016, a report addressing the matters identified in Part IV.D of this Order.

By the Commission.

Stacy L. Ruble
Secretary

APPENDIX A

PROCEDURAL SUMMARY

Postal Service filing. On December 11, 2014, the Postal Service filed a petition pursuant to 39 C.F.R. § 3050.11 seeking initiation of a rulemaking proceeding to consider Proposal Thirteen.[1] The Postal Service concurrently filed a notice in Docket No. RM2011-3 because Proposal Thirteen was responsive to a Commission directive in that docket establishing an update to the city carrier street time (street time) costing approach as the highest research priority.[2]

The Petition includes two attachments: Proposal Thirteen[3] and a report[4] on the Street Time Cost Study prepared by Postal Service consultant Michael D. Bradley.

The Postal Service also filed two supporting library references (one public, one non-public), along with an application for non-public treatment of the material filed under seal.[5] The public library reference includes a sample data set of 300 ZIP Codes used in two special cost studies relating to Proposal Thirteen. The sample data set was drawn from the Postal Service's entire Form 3999 database, with individual ZIP Codes masked to avoid disclosing the actual ZIP Codes. The non-public library reference includes a crosswalk file linking the masked set of ZIP Codes to actual ZIP Codes.[6]

Main procedural developments. The main procedural developments in this case include:

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[1] Petition. 39 C.F.R. § 3050.11 establishes procedures for advance consideration of proposed changes to analytical principles used in the Postal Service's annual reports.

[2] Docket No. RM2011-3, Notice of the United States Postal Service of Filing Proposal to Update City Carrier Costing, December 11, 2014; *see* Order No. 1626, Order Setting Near-Term Priorities and Requesting Related Reports, January 18, 2013, at 3.

[3] *See* Petition, Proposal 13: Updating the City Carrier Street Time Cost Model.

[4] *See* Street Time Report.

[5] Notice of Filing of USPS-RM2015-7/1, USPS-RM2015-7/NP1, and Application for Nonpublic Treatment, December 11, 2014.

[6] USPS-RM2015-7/1, Preface at 1.

- sponsorship, by UPS, of an alternative approach to street time costing in conjunction with its initial comments on Proposal Thirteen;
- the Commission's granting of a contested UPS motion for access to an additional confidential crosswalk file for all ZIP Codes in the Form 3999 database;
- UPS's subsequent sponsorship of two other street time costing approaches in place of its original approach;
- expansion of this docket to include consideration of the two successor UPS costing approaches;
- the Commission's exclusion of an additional UPS approach from the record; and
- the Postal Service's revision of Proposal Thirteen to reflect the correction of a scan time calculation in one of the special cost studies.

Initial Commission action. On December 18, 2014, the Commission issued Order No. 2294 establishing Docket No. RM2015-7 for consideration of Proposal Thirteen. The Commission also designated, pursuant to 39 U.S.C. § 505, an officer of the Commission (Public Representative) to represent the interests of the general public; scheduled a technical conference for January 14, 2015; and established March 11, 2015, and April 8, 2015, respectively, as the dates for filing comments and reply comments. Order No. 2294 at 4.

Information requests. On January 6, 2015, the Chairman issued an information request. CHIR No. 1. The Postal Service filed responses to CHIR No. 1 on January 12, 2015, and January 15, 2015.[7] The Chairman subsequently issued, and the Postal

[7] January 12 Response to CHIR No. 1; January 15 Response to CHIR No. 1. The Postal Service also filed a motion for late acceptance of its January 15 Response to CHIR No. 1. *See* Postal Service Motion for Late Acceptance. The Postal Service Motion for Late Acceptance is granted.

Service filed timely responses to, three additional information requests.[8] The Postal Service also filed responses to two informal requests for information from UPS.[9] The technical conference was held, as scheduled, on January 14, 2015.

First UPS access request. On February 18, 2015, UPS filed an unopposed motion seeking access to the confidential crosswalk file unmasking the set of 300 ZIP Codes. February 18 UPS Motion for Access. The Commission granted the February 18 UPS Motion for Access on February 24, 2015. Order No. 2363 at 4.

Initial comments. On March 11, 2015, the Commission extended the initial and reply comment deadlines to March 18, 2015, and April 15, 2015, respectively, in response to filings from the Public Representative and the Postal Service.[10]

Subsequently, DMA, PostCom, the Public Representative, and UPS filed initial comments on Proposal Thirteen, consistent with the revised deadline.[11] The March 18 UPS Comments Attaching Neels Report included a report prepared by UPS consultant Kevin Neels presenting an alternative to Proposal Thirteen based, in part, on an analysis of the unmasked set of 300 ZIP Codes.[12]

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[8] CHIR No. 2; CHIR No. 3; CHIR No. 4; Response to CHIR No. 2; Response to CHIR No. 3; Response to CHIR No. 4. The Postal Service also filed a library reference with its Response to CHIR No. 4. Notice of the United States Postal Service of Filing of USPS-RM2015-7/4, June 11, 2015 (USPS-RM2015-7/4 Notice).

[9] Notice of the United States Postal Service of Filing of USPS-RM-2015-7/2, March 2, 2015; Notice of the United States Postal Service of Providing Informal Responses to UPS Questions, May 28, 2015.

[10] Order No. 2389 at 2. *See* PR Motion to Extend Time; March 10 Postal Service Response to Motion.

[11] DMA Comments; PostCom Comments; PR Comments; March 18 UPS Comments Attaching Neels Report. UPS also filed a library reference in support of its March 18 UPS Comments Attaching Neels Report. Notice of Filing of Library Reference UPS-LR-RM2015-7/1, March 18, 2015.

[12] March 18 Neels Report at 17-25; *see* UPS-LR-RM2015-7/1. The March 18 Neels Report includes a description of the Initial Form 3999 model, which UPS would later describe as "preliminary work." June 8 UPS Comments Attaching Neels Report at 3.

Second UPS access request. In conjunction with the March 18 UPS Comments Attaching Neels Report, UPS filed a motion seeking access to a crosswalk file for all ZIP Codes in the Form 3999 database to support further testing of the Initial Form 3999 model and development of an appropriate costing methodology. March 18 UPS Motion for Access. The Postal Service opposed the March 18 UPS Motion for Access, and UPS filed a counterpleading.[13] In interim Order No. 2433, the Commission directed UPS to provide an estimated date for submission of further analysis based on the entire Form 3999 database, in the event the March 18 UPS Motion for Access was granted. Order No. 2433 at 2. The Commission suspended the deadline for replies to initial comments on Proposal Thirteen pending resolution of the March 18 UPS Motion for Access. *Id*. at 3.

On April 14, 2015, UPS requested a deadline of no earlier than June 5, 2015, for submission of an analysis based on the entire Form 3999 database. UPS Response to Order No. 2433 at 3. On April 23, 2015, following consideration of the March 18 UPS Motion for Access and further Postal Service and UPS pleadings, the Commission issued Order No. 2455 granting the contested March 18 UPS Motion for Access. Order No. 2455 at 11. The Commission directed the Postal Service to provide the crosswalk file for all ZIP Codes in the Form 3999 database by no later than April 24, 2015. *Id*. at 12. The Postal Service complied with the Order No. 2455 directive.[14] Amazon later sought, and the Commission granted, access to the confidential crosswalk files.[15] In Order No. 2455, the Commission also established the following filing deadlines: May 13, 2015, as the deadline for replies to initial comments on Proposal Thirteen;

[13] Postal Service Answer in Opposition; UPS Motion for Leave; UPS Reply to Opposition; *see* Postal Service Request for Extension of Time; Order No. 2412.

[14] Notice of the United States Postal Service of Filing of USPS-RM2015-7/NP2 in Response to Order No. 2455, April 24, 2015.

[15] May 22 Amazon Motion for Access; Order No. 2520 at 2. The Postal Service did not oppose the Amazon Access Motion. May 22 Amazon Motion for Access at 1.

June 8, 2015, as the date for UPS to file a follow-up analysis; and July 8, 2015, and July 15, 2015, respectively, as the deadlines for filing initial and reply comments on UPS's follow-up analysis. Order No. 2455 at 12.

Replies to initial comments. On May 13, 2015, three commenters filed replies to initial comments on Proposal Thirteen: NPPC, PSA, and the Postal Service.[16]

Revision to Proposal Thirteen. On June 11, 2015, the Postal Service filed a response to an information request identifying an error in calculations of scan time, along with a related library reference.[17] Correction of this error resulted in a revision to Proposal Thirteen's original estimate of the impact on product costs. *See* Response to CHIR No. 4, question 1c.

UPS filings. On June 8, 2015, UPS filed comments proposing two replacements for the Initial Form 3999 model, as well as the June 8 Neels Report and a supporting library reference.[18] The replacement approaches are the National Form 3999 model (UPS's preferred model) and Modified Proposal Thirteen (UPS's alternative model). On June 9, 2015, the Commission issued Order No. 2538 granting unopposed motions of

[16] NPPC Reply Comments; PSA Reply Comments; Postal Service Reply Comments. In addition to addressing initial comments, PSA expressed disagreement with the Commission's expansion of the docket to include consideration of the alternative approaches proposed by UPS. PSA Reply Comments at 1-4.

[17] Response to CHIR No. 4, question 1c. *See* USPS-RM2015-7/4 Notice. This library reference includes a replacement software program (with scan time removed). This program is a revised version of a corresponding file in USPS-RM2015-7/1. The three workbooks in USPS-RM2015-7/4 replace the corresponding workbooks filed with USPS-RM2015-7/1.

[18] June 8 UPS Comments Attaching Neels Report. The report referred to in the caption (cited in this Order as the June 8 Neels Report) appears as Exhibit A to the June 8 UPS Comments Attaching Neels Report. *See* Notice of Filing of Library Reference UPS-LR-RM2015-7/NP1 -- Errata, June 9, 2015 (revising the library reference designation).

the Postal Service and Amazon for access to the material in UPS's non-public library reference.[19]

Comments on UPS's alternative costing approaches. On July 8, 2015, Amazon, the Public Representative, and the Postal Service filed comments addressing the June 8 Neels Report.[20] The Amazon Comments on June 8 Neels Report were accompanied by the declaration of Christian T. Lundblad and a supporting library reference.[21] The Postal Service Comments on June 8 Neels Report were accompanied by the Bradley Analysis of June 8 Neels Report. Postal Service Comments on June 8 Neels Report; Bradley Analysis of June 8 Neels Report.

UPS reply. On July 22, 2015, UPS filed a reply to the Postal Service Comments on June 8 Neels Report and the Amazon Comments on June 8 Neels Report. July 22 UPS Reply Comments Attaching Neels Report. The July 22 UPS Reply Comments Attaching Neels Report included the July 23 Neels Report, which offered the Modified National Form 3999 model for consideration, and a supporting non-public library reference.[22] Amazon and the Postal Service subsequently filed, and the Commission granted, unopposed motions for access to sealed material UPS filed in conjunction with the July 23 Neels Report.[23]

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[19] Order No. 2538 at 2. *See* June 9 Postal Service Motion for Access; Amazon Unopposed Motion.

[20] Amazon Comments on June 8 Neels Report; PR Comments on June 8 Neels Report; Postal Service Comments on June 8 Neels Report.

[21] Amazon Comments on June 8 Neels Report; July 8 Lundblad Declaration; Notice of Filing of Library Reference by Amazon Fulfillment Services, Inc., July 8, 2015. Amazon refiled the July 8 Lundblad Declaration to correct a minor (non-substantive) formatting error. July 10 Lundblad Declaration; *see* Errata Notice of Amazon Fulfillment Services, Inc., July 10, 2015.

[22] July 23 Neels Report. *See* Notice of Filing of Library Reference UPS-LR-RM2015-7/NP2, July 22, 2015.

[23] July 23 Postal Service Motion for Access; July 27 Amazon Motion for Access; Order No. 2607 at 2; Order No. 2618 at 2.

Motions to strike. The Postal Service and Amazon filed motions to strike the Modified National Form 3999 model accompanying the July 22 UPS Reply Comments Attaching Neels Report.[24] On August 10, 2015, the Commission issued Order No. 2646 granting the Motions to Strike. Order No. 2646 at 16.

[24] Postal Service Motion to Strike; Amazon Motion to Strike (collectively, Motions to Strike).

APPENDIX B

COMMISSION REVIEW OF ALLEGED OMITTED-VARIABLE BIAS

UPS expresses a concern in this docket that parcels are important variables that have been inappropriately omitted from the Postal Service's Regular Delivery model. March 18 UPS Comments Attaching Neels Report at 10. The reason for UPS's concern is that if a regression model inappropriately leaves out important explanatory variables, the estimates may be biased.

Bias will be present in a model if the regression parameters of the omitted variables are significantly different from zero and all the terms which comprise omitted variables highly correlate with the terms which comprise other explanatory variables. In economic literature, this type of bias is referred to as omitted-variable bias.[1]

Under most circumstances, potentially omitted variables are not available, so it is not possible to determine whether a model exhibits omitted-variable bias. However, volumes for both in-receptacle parcels and deviation parcels are available in this docket, so it is possible to test whether the Regular Delivery model in Proposal Thirteen exhibits omitted-variable bias due to estimating two parcel variabilities in separate regressions. To perform this test, the Commission ran three regressions, each of which is a variation on the Postal Service's Regular Delivery model. The first regression added in-receptacle parcel volumes to the Postal Service's Regular Delivery model. The second regression added deviation parcel volumes to the Postal Service's Regular Delivery model. The third regression included both in-receptacle parcels and deviation parcels in the Regular Delivery model.

[1] *See, e.g.,* Wooldridge, *supra* note 36. An explanatory variable in a flexible quadratic functional form regression is comprised of many terms. Specifically, it is comprised of a linear term, its square, and the cross-products of the linear terms associated with the other explanatory variables in the regression. In this Appendix, a reference to a variable encompasses all the terms which comprise that variable.

The Commission utilized the following data sets in the regression analyses:

- the FY 2014 Parcel/Accountable Study for in-receptacle and deviation parcel volumes;
- DOIS data for regular delivery volumes and total street time;
- Form 3999 allied time data for directly attributable delivery time; and
- the FY 2013 Collection Mail Study for collection volumes.[2]

The Commission also developed route mode dummy variables to account for different delivery technologies on segments within a route for in-receptacle parcels and deviation parcels.

In the first and second regressions, in-receptacle parcels and deviation parcels were separately tested to determine whether they exhibited omitted-variable bias. The third regression included in-receptacle parcels and deviation parcels, and tested whether one variable, the other, or both, exhibited omitted-variable bias.

The Commission used the same flexible quadratic functional regression form the Postal Service used in its Regular Delivery model. All data were from FY 2014, with the exception of collection mail volumes.[3] To approximate FY 2014 collection mail volume data, the Commission applied the percentage change in annual collection mail volumes between FY 2013 (the year for which sample data were available) and FY 2014 to each

[2] *See* USPS-RM2015-7/1, "package_study_volume_masked_zips.sas7bdat," "carrier_input.sas7bdat," "dois_package_study_masked_zips.sas7bdat," "masked_zip_characteristics.sas7bdat," and "doiscv13.sas7bdat" files.

[3] FY 2014 collection mail volumes were not available because the Postal Service's routine operational data systems do not include them and the Postal Service's collection mail study was conducted in FY 2013. *See* Street Time Report at 27, 32.

route for each day in the FY 2013 Collection Mail Study sample.[4]

The results of the first regression indicated that in-receptacle parcel parameters are jointly significantly different from zero, and in-receptacle parcels are significantly correlated with every other explanatory variable. To evaluate whether all effects of in-receptacle parcels are significant, accepted econometric theory considers it necessary to perform a test of joint significance.[5] This test is required since there are many interaction terms which are not significantly different from zero. A similar conclusion was reached from examining the results of the second regression, *i.e.*, deviation parcel parameters were jointly significantly different from zero and deviation parcels were significantly correlated with every other explanatory variable. Finally, the Commission tested whether the omission of both in-receptacle parcels and deviation parcels in a single delivery model produced biased estimates. The Commission's final regression indicated that when both parcel variables were included, only deviation parcel parameters were jointly significantly different from zero and deviation parcels were significantly correlated with every other explanatory variable.

Because the results of the three regressions are mixed, the Commission cannot definitively determine whether one or both parcel variables may have been inappropriately omitted from the Postal Service's Regular Delivery model.[6] However, the Commission observes that the correlation between the linear terms of in-receptacle and deviation parcel variables is very strong and all linear shape variables are

[4] The annual change in total collection mail volume between FY 2013 and FY 2014 was approximately 5 percent. *See* Docket No. ACR 2014, Library Reference USPS-FY14-34, December 29, 2014, "CCCS_FY2014_Collection_Final_Public.xls" file; Docket No. ACR 2013, Library Reference USPS-FY13-34, December 27, 2013, "CCCS_FY2013_Collection_Final_Public.xls" file.

[5] *See* Jack Johnston & John DiNardo, *Econometric Methods* 91 (4th ed. 1997).

[6] It is likely that between FY 2013 and FY 2014, collection mail volumes for the sampled routes changed daily by a percentage different from 5 percent. As each FY 2013 collection mail volume observation was reduced by the annual percentage reduction between FY 2013 and FY 2014, the Commission's adjusted FY 2014 sample collection data was measured in error.

significantly correlated with each other. The additional multicollinearity introduced into the third regression may explain why in-receptacle parcels did not pass a test of joint significance when both types of parcels are included. A widely-accepted approach to reducing multicollinearity is to use a larger data set, provided the additional data are close to being correct.[7] Thus, a data set much larger than the 300 ZIP Code sample the Postal Service used would likely allow for a more accurate test of whether in-receptacle parcels and deviation parcels are each jointly significant and a better assessment as to whether they should be included in the Regular Delivery model.

The results from the three regressions described in this Appendix are presented in a set of tables in an accompanying library reference.[8]

[7] *See* Peter Kennedy, *A Guide to Econometrics* 199 (6th ed. 2008).

[8] Library Reference PRC-LR-1-RM2015-7/1, October 29, 2015, "OV Devpar Bias.rtf," "OV IR Bias.rtf," and "OV IR_DevPar Bias.rtf" files.

APPENDIX C

REVIEW OF CITY CARRIER STREET TIME COSTING

Magnitude of city carrier street time costs. The city carrier network is the largest part of the Postal Service's delivery network. In FY 2013, it incurred total direct labor costs of almost $16 billion. Street Time Report at 1. More than $12 billion of those costs were city carrier street time costs. *Id*. Thus, city carrier street time costs represented more than 75 percent of total direct city carrier costs and, overall, 16.7 percent of the Postal Service's total accrued costs. *Id*.

Costing approach prior to Docket No. R2005-1. Accurate estimation of street time costs is not just a recent concern. Instead, given the absolute and relative size of street time costs, changes in mail volume and mail mix, and the evolution of the mail processing and delivery environment, estimation of street time costs was also a major focus of rate cases during the Postal Reorganization Act (PRA) era.

During much of the PRA era, the street time costing methodology was based on a series of special studies. These studies relied on a fragmented collection of cross-sectional data sets, which were collected at different times, with different sample designs and analytic methods. Docket No. R2005-1, Opinion at 55. The focus of these special studies was on discrete carrier activities. To capture the time associated with these activities, the Street Time Sample Study used a tally technique (similar to that used in the In-Office Cost System) to sample work activity on the street and allocate all street time to broad functional cost pools (*e.g.*, travel time, runtime, and load time). *Id*. The runtime cost pool was disaggregated into fixed time (route time) and variable time (access time) by regressing runtime on various levels of simulated stop coverage. *Id*. A portion of the resulting access time cost was then distributed to subclasses pursuant to the Single Subclass Stop analysis, which identified stops that received mail of only one subclass on a given day and attributed to the responsible subclass the cost incurred in approaching these stops. *Id*.

The load time cost pool was disaggregated into volume variable (elemental) load time and other load time by regressing load time on volumes of mail of the basic types (letter, flat, parcel, accountable, and collection mail). *Id*. The regression used load time data gathered by a "stop watch" technique administered by data technicians and volume data by type collected during the Load Time Variability Study. *Id*. Other load time was considered to vary with changes in the percentage of delivery points that were covered. *Id*. The cost of coverage related load time was attributed to each subclass according to its share of single subclass deliveries. *Id*.

Docket No. R2005-1 costing approach. Conceptually, the R2005-1 costing approach departed in several significant ways from the established approach. It divided city carrier street activities into two main categories: Regular Delivery and Deviation Delivery. Regular Delivery was defined as travel along route segments where deliveries were made into the customer's mail receptacle. Docket No. R2005-1, USPS-T-14 at 20. Deviation Delivery was defined as moving away from the customer's mail receptacle because a parcel would not fit into it, or because it was necessary, in the case of accountables, to attempt customer contact to obtain a signature or hand-deliver registered mail. *Id.* at 22-23, 27.

The Docket No. R2005-1 costing approach also began estimating variabilities by mail shape, on grounds that this reflected changes in the processing and delivery environment and that data should be obtained from one large sample, not multiple smaller ones. *Id.* at 12-14, 27. The increased focus on shape was driven, in part, by new operational delivery conditions, such as the widespread adoption of DPS mail and the development of mail bundles.[1] These developments meant that carriers now delivered separate bundles of DPS mail, cased mail, and sequenced mail. *Id.* One large data sample was obtained because all of the data in the established approach had

[1] Rebuttal Testimony of Michael D. Bradley on Behalf of the United States Postal Service, September 8, 2005, at 47.

been collected in the 1980s, with some collected as early as 1985 and did not reflect the conditions at the time of Docket No. R2005-1. Docket No. R2005-1, USPS-T-14 at 1-2, 12.

The Docket No. R2005-1 econometric model used a quadratic functional form to regress directly attributable street time against mail shapes and geographic variables, such as delivery points and postal density, to estimate the variability of each mail shape. *Id.* at 28. Attributable costs by shape were developed by multiplying the variability of each mail shape by accrued direct delivery costs. *Id.* at 56-57. These costs were then distributed to each product according to the share of each product in total delivered volume. *Id.*

The Commission found that the Docket No. R2005-1 costing approach reflected numerous improvements over the established approach, but also expressed concerns about data quality and cost modeling. Docket No. R2005-1, Opinion at 61-69; Appendix I at 9. Given these concerns, the Commission urged the Postal Service to continue its analytical work to improve data quality of data and explore additional econometric models in the interest of obtaining more robust results. Docket No. R2005-1, Opinion at 74.

Docket No. RM2011-3 strategic rulemaking. In Docket No. RM2011-3, a rulemaking established to address research priorities, the Commission identified an update to the street time costing approach as one of several candidates for improvements in data collection and analysis.[2] This decision was based on continuing questions about data quality, the importance of the size of street time costs in both absolute and relative terms, the length of time since data had been collected, and numerous developments affecting street delivery. Later, the Commission elevated

[2] *See* Docket No. RM2011-3, Order No. 589, Notice and Order of Proposed Rulemaking on Periodic Reporting, November 18, 2010, Attachment at 1.

street time costing to the highest near-term research priority.[3] Subsequently, the Postal Service filed a Scoping Study which investigated the usefulness of existing databases to estimate cost pools and variabilities and explored options for forming cost pools and estimating variabilities. Docket No. RM2011-3, Scoping Study at 1. Proposal Thirteen is the follow-up to the Scoping Study.

[3] *See* Docket No. RM2011-3, Order No. 1829, Summary of Recent Research Activity and Inquiry Regarding Timetable for Completing Analyses and Applying Results, September 5, 2013.

APPENDIX D

ANALYSES, DECLARATIONS, REPORTS, COMMENTS, AND REPLY COMMENTS

Analyses, Declarations, and Reports

Filing Date	Commenter	Caption of Filing	Short Form
December 11, 2014	United States Postal Service	Petition of the United States Postal Service for the Initiation of a Proceeding to Consider Proposed Change in Analytical Principles (Proposal Thirteen), Report on the City Carrier Street Time Study	Street Time Report
March 18, 2015	United Parcel Service, Inc.	United Parcel Service Comments on Postal Service Proposal Thirteen Regarding City Carrier Street Time Costs, Exhibit A	March 18 Neels Report
May 13, 2015	United States Postal Service	Analysis of the Report of Dr. Kevin Neels On Behalf of United Parcel Service	Bradley Analysis of March 18 Neels Report
June 8, 2015	United Parcel Service, Inc.	United Parcel Service Comments Attaching Supplemental Report Related to Proposal Thirteen, Exhibit A	June 8 Neels Report
July 8, 2015	Amazon Fulfillment Services, Inc.	Declaration of Christian T. Lundblad on Behalf of Amazon Fulfillment Services, Inc.	July 8 Lundblad Declaration
July 8, 2015	United States Postal Service	Reply Comments of the United States Postal Service in Response to UPS Supplemental Report, Analysis of the Supplemental Report of Dr. Kevin Neels On Behalf of United Parcel Service	Bradley Analysis of June 8 Neels Report

July 10, 2015	Amazon Fulfillment Services, Inc.	Declaration of Christian T. Lundblad on Behalf of Amazon Fulfillment Services, Inc.	July 10 Lundblad Declaration
July 23, 2015	United Parcel Service, Inc.	Second Supplemental Report of Kevin Neels on Behalf of United Parcel Service	July 23 Neels Report

Comments and Reply Comments

Filing Date	Commenter	Caption of Filing	Short Form
March 11, 2015	Direct Marketing Association	Comment of the Direct Marketing Association	DMA Comments
March 18, 2015	Association for Postal Commerce	Comments of the Association for Postal Commerce	PostCom Comments
March 18, 2015	Public Representative	Public Representative Comments	PR Comments
March 18, 2015	United Parcel Service, Inc.	United Parcel Service Comments on Postal Service Proposal Thirteen Regarding City Carrier Street Time Costs	March 18 UPS Comments Attaching Neels Report
April 15, 2015	United States Postal Service	Comment of the United States Postal Service in Regard to Supplemental Information Provided by UPS	April 15 Postal Service Comments
April 16, 2015	United Parcel Service, Inc.	United Parcel Service's Reply to Comment of the United States Postal Service in Regard to Supplemental Information Provided by UPS	April 16 UPS Reply Comments
May 13, 2015	National Postal Policy Council	Reply Comments of the National Postal Policy Council	NPPC Reply Comments
May 13, 2015	Parcel Shippers Association	Reply Comments of the Parcelshippers Association	PSA Reply Comments
May 13, 2015	United States Postal Service	Reply Comments of the United States Postal Service in Response to March 18th Comments	Postal Service Reply Comments
June 8, 2015	United Parcel Service, Inc.	United Parcel Service Comments Attaching Supplemental Report Related to Proposal Thirteen	June 8 UPS Comments Attaching Neels Report

July 8, 2015	Amazon Fulfillment Services, Inc.	Comments of Amazon Fulfillment Services, Inc.	Amazon Comments on June 8 Neels Report
July 8, 2015	Public Representative	Public Representative Initial Comments on United Parcel Service's Supplemental Report	PR Comments on June 8 Neels Report
July 8, 2015	United States Postal Service	Reply Comments of the United States Postal Service in Response to UPS Supplemental Report	Postal Service Comments on June 8 Neels Report
July 22, 2015	United Parcel Service, Inc.	United Parcel Service, Inc.'s Reply to Comments of the United States Postal Service and Amazon Fulfillment Services, Inc. Related to Proposal Thirteen	July 22 UPS Reply Comments Attaching Neels Report

APPENDIX E

CHIRS, MOTIONS, ORDERS, AND RESPONSES

Chairman's Information Requests and Related Responses

Chairman's Information Requests

Chairman's Information Request No. 1, January 6, 2015 (CHIR No. 1)

Chairman's Information Request No. 2, February 4, 2015 (CHIR No. 2)

Chairman's Information Request No. 3, March 20, 2015 (CHIR No. 3)

Chairman's Information Request No. 4, June 4, 2015 (CHIR No. 4)

Responses to Chairman's Information Requests

Responses of the United States Postal Service to Questions 1-16 and 19-28 of Chairman's Information Request No. 1, January 12, 2015 (January 12 Response to CHIR No. 1)

Responses of the United States Postal Service to Questions 17-18 of Chairman's Information Request No. 1, January 15, 2015 (January 15 Response to CHIR No. 1)

Responses of the United States Postal Service to Questions 1-10 of Chairman's Information Request No. 2, February 11, 2015 (Response to CHIR No. 2)

Responses of the United States Postal Service to Questions 1-12 of Chairman's Information Request No. 3, March 27, 2015 (Response to CHIR No. 3)

Responses of the United States Postal Service to Questions 1-3 of Chairman's Information Request No. 4, June 11, 2015 (Response to CHIR No. 4)

Motions for Late Acceptance of Responses

Motion of the United States Postal Service for Late Acceptance of Response to Questions 17-18 of Chairman's Information Request No. 1, January 15, 2015 (Postal Service Motion for Late Acceptance)

Motions and Related Responses

Motions

United Parcel Service, Inc.'s Motion Requesting Access to Non-Public Materials Relevant to Proposal Thirteen Under Protective Conditions, February 18, 2015 (February 18 UPS Motion for Access)

Motion for Extension of Time to File Comments, March 9, 2015 (PR Motion to Extend Time)

Motion of United Parcel Service, Inc. for Issuance of Information Request Relevant to Proposal Thirteen, March 18, 2015 (March 18 UPS Motion for Access)

Motion of United Parcel Service, Inc. for Leave to File Reply to United States Postal Service Opposition to UPS Motion Requesting Issuance of an Information Request Related to Proposal Thirteen, April 2, 2015 (UPS Motion for Leave)

Motion of Amazon Fulfillment Services, Inc., for Access to Two Nonpublic Documents Filed by the United States Postal Service, May 22, 2015 (May 22 Amazon Motion for Access)

Unopposed Motion of Amazon Fulfillment Service, Inc., for Access to Documents Filed by United Parcel Service, Inc., June 9, 2015 (Amazon Unopposed Motion)

Motion of the United States Postal Service for Access to Materials Filed Under Seal by United Parcel Service, June 9, 2015 (June 9 Postal Service Motion for Access)

United Parcel Service, Inc.'s Motion for Extension of Time to File Reply Comments and for Other Relief, June 30, 2015 (UPS Motion for Extension)

Motion of the United States Postal Service for Access to Further Materials Filed Under Seal by United Parcel Service, July 23, 2015 (July 23 Postal Service Motion for Access)

Motion of Amazon Fulfillment Services, Inc., for Access to Further Materials Filed Under Seal by United Parcel Service, Inc., July 27, 2015 (July 27 Amazon Motion for Access)

Motion of the United States Postal Service to Strike Third Set of Models Submitted by United Parcel Service, July 27, 2015 (Postal Service Motion to Strike)

Motion of Amazon Fulfillment Services, Inc., to Strike Portions of Reply Comments Filed by United Parcel Service, Inc. on July 22 and 23, 2015, July 29, 2015 (Amazon Motion to Strike)

Responses

Response of the United States Postal Service to Motion of the Public Representative for Extension of Time to File Comments, March 10, 2015 (March 10 Postal Service Response to Motion)

Response of the United States Postal Service to UPS Motion for Extension of Time to File Comments and Other Relief, July 2, 2015 (July 2 Postal Service Response to Motion)

United Parcel Service, Inc.'s Response to Motion of Amazon Fulfillment Services, Inc. to Strike Portions of UPS's Reply Comments, August 3, 2015 (UPS Response to Motion)

Request

Request of the United States Postal Service for Extension of Time to Respond to UPS Motion Regarding Issuance of an Information Request, March 23, 2015 (Postal Service Request for Extension of Time)

Answer

Answer of the United States Postal Service in Opposition to UPS Motion Requesting Issuance of an Information Request, March 30, 2015 (Postal Service Answer in Opposition)

Replies

United Parcel Service Reply to United States Postal Service Opposition to UPS Motion Requesting Issuance of an Information Request Related to Proposal Thirteen, April 2, 2015 (UPS Reply to Opposition)

United Parcel Service, Inc.'s Reply to Motion of the United States Postal Service to Strike Third Set of Models Submitted by United Parcel Service, July 29, 2015 (UPS Reply to Motion to Strike)

Orders and Related Responses

Orders

Notice and Order on Petition for Rulemaking (Proposal Thirteen), December 18, 2014 (Order No. 2294)

Order Granting Motion for Access to Non-Public Material, February 24, 2015 (Order No. 2363)

Order Extending Comment Deadlines, March 11, 2015 (Order No. 2389)

Order Granting Extension of Time to File Answers to Pending Motion for Information Request, March 25, 2015 (Order No. 2412)

Order Directing United Parcel Service, Inc. to File Supplemental Information and Suspending Reply Comment Deadline, April 9, 2015 (Order No. 2433)

Order Granting United Parcel Service, Inc. Motion for Issuance of Commission Information Request No. 1 and Revising Procedural Schedule, April 23, 2015 (Order No. 2455)

Order Granting Request for Access, May 29, 2015 (Order No. 2520)

Order Granting Unopposed Motions for Access, June 9, 2015 (Order No. 2538)

Order Granting Motion of United Parcel Service, Inc. for Access to Certain Non-Public Material and Extending Reply Comment Deadline, July 8, 2015 (Order No. 2571)

Order Granting Motion of the United States Postal Service for Access to Further Materials Filed Under Seal by United Parcel Service, July 23, 2015 (Order No. 2607)

Order Granting Unopposed Access to Further Materials Filed Under Seal by United Parcel Service, July 28, 2015 (Order No. 2618)

Order Granting Motions to Strike, August 10, 2015 (Order No. 2646)

Response

United Parcel Service's Supplemental Information in Response to Order No. 2433, April 14, 2015 (UPS Response to Order No. 2433)